The PHOTOFACT® Servicer

SET 469 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JAN., 1960

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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Airline Model
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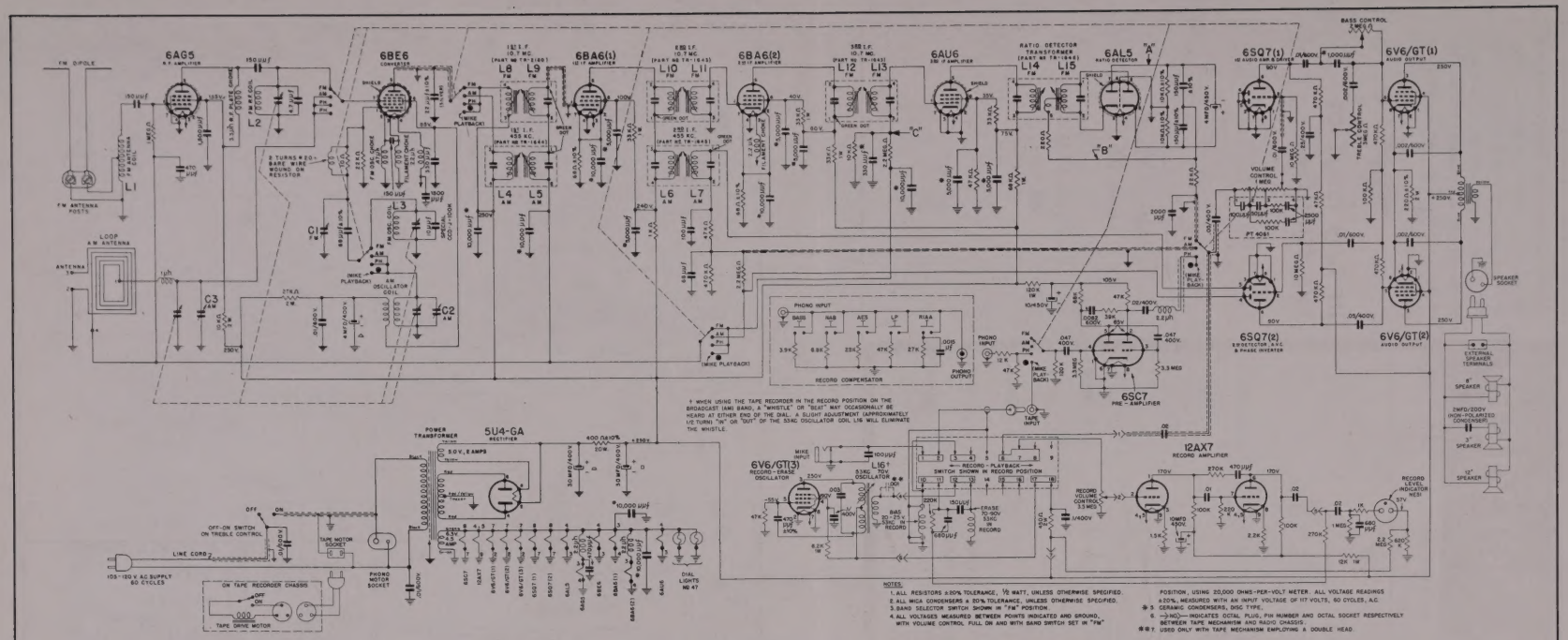
584



† WHEN USING THE TAPE RECORDER IN THE RECORD POSITION ON THE BROADCAST (AM) BAND, A "WHISTLE" OR "BEAT" MAY OCCASIONALLY BE HEARD AT EITHER END OF THE DIAL. A SLIGHT ADJUSTMENT (APPROXIMATELY 1/2 TURN) "IN" OR "OUT" OF THE 534C OSCILLATOR COIL L16 WILL ELIMINATE THE WHISTLE.

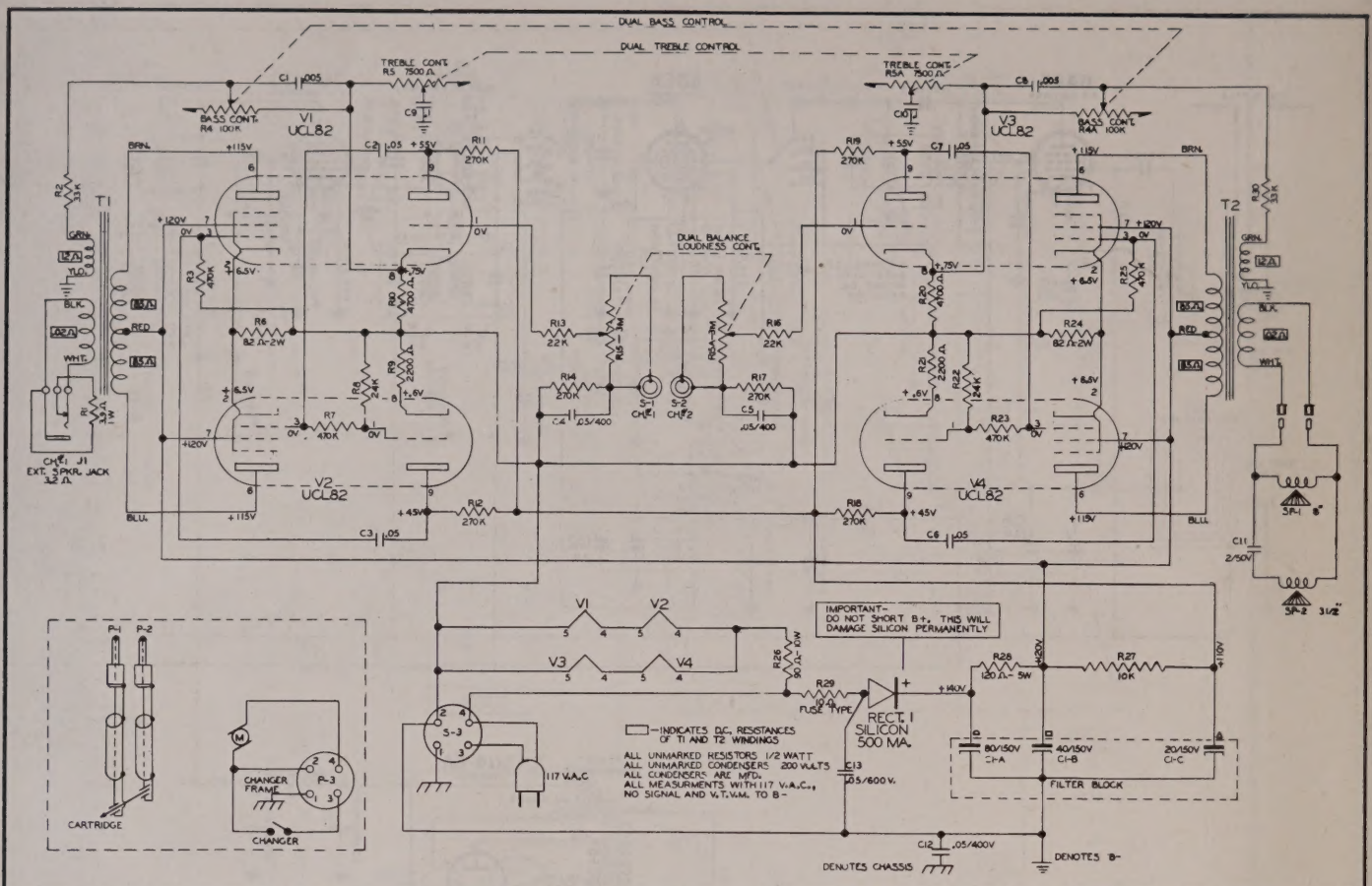
NOTES:
1. ALL RESISTORS ±20% TOLERANCE, ½ WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL MICA CONDENSERS ± 20% TOLERANCE, UNLESS OTHERWISE SPECIFIED.
3. BAND SELECTOR SWITCH SHOWN IN "FM" POSITION.
4. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON AND WITH BAND SWITCH SET IN "FM" POSITION, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ±20%, MEASURED WITH AN INPUT VOLTAGE OF 117 VOLTS, 60 CYCLES, A.C.
5 ⊃ CERAMIC CONDENSERS, DISC TYPE.
6 ⊸○○⊸ INDICATES OCTAL PLUG, PIN NUMBER AND OCTAL SOCKET RESPECTIVELY BETWEEN TAPE MECHANISM AND RADIO CHASSIS.
*† USED ONLY WITH TAPE MECHANISM EMPLOYING A DOUBLE HEAD.

ALIGNMENT PROCEDURE CHART

STEP	SET BAND SWITCH ON-	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN POINTER TO-	READ OUTPUT ON-	ADJUST THE FOLLOWING- (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE)
BEFORE ALIGNING CLOSE VARIABLE CONDENSER FULLY COUNTER-CLOCKWISE (PLATES FULLY CLOSED) AND ADJUST POINTER TO COINCIDE WITH THE BEGINNING OF DIAL SCALE.						
1	F M	PIN 1 OF 6AU6 TUBE FOR .1 VOLT SIGNAL	10.7 MC. UNMODULATED SIGNAL.	EXTREME RIGHT HAND POSITION (CONDENSER PLATES FULLY OPEN)	VACUUM TUBE VOLTMETER ACROSS 10,000 OHM RESISTOR (SEE 'A' ON CIRCUIT DIAGRAM).	L14 (RATIO DETECTOR PRIMARY, SLUG ON UNDERSIDE OF CHASSIS) FOR MAXIMUM READING.
2	F M				VACUUM TUBE VOLTMETER BETWEEN 'B' AND CHASSIS (SEE CIRCUIT DIAGRAM)	L15 (RATIO DETECTOR SECONDARY, SLUG ON TOP OF CHASSIS) FOR ZERO READING.
3	F M	6BE6 THRU A TWO TURN LOOP AROUND TUBE ENVELOPE (LOOSELY COUPLED)			VACUUM TUBE VOLTMETER ACROSS 10,000 OHM RESISTOR (SEE 'C' ON CIRCUIT DIAGRAM).	L8 (SLUG ON UNDERSIDE OF CHASSIS) L9 (SLUG ON TOP OF CHASSIS) FOR MAXIMUM READING.
4	F M					L10 (TOP) THEN L11 (UNDERSIDE) L12 (TOP) THEN L13 (UNDERSIDE) FOR MAXIMUM READING.
5	A M	R.F. SECTION OF VARIABLE CONDENSER OR PIN 7 OF THE 6BE6 TUBE IN SERIES WITH A .1MFD, 400 VOLT CONDENSER	455 KC.		OUTPUT METER ACROSS SPEAKER VOICE-COIL.	L4 (SLUG ON UNDERSIDE OF CHASSIS) L5 (SLUG ON TOP OF CHASSIS) FOR MAXIMUM READING.
6	A M					L6 (SLUG ON UNDERSIDE OF CHASSIS) L7 (SLUG ON TOP OF CHASSIS) FOR MAXIMUM READING.
7	F M	REPEAT STEPS 3 AND 4.				
8	F M	CONNECT F M SIGNAL GENERATOR TO DIPOLE TERMINAL POSTS USING A 150 OHM RESISTOR IN SERIES WITH THE HIGH SIDE AND A 150 OHM RESISTOR IN SERIES WITH THE GROUND SIDE OF SIGNAL GENERATOR. USE 30 % FREQUENCY MODULATED SIGNAL.	88 MC.	88 MC. ON DIAL.	OUTPUT METER ACROSS SPEAKER VOICE-COIL.	*L3 (OSCILLATOR COIL, ON UNDERSIDE OF CHASSIS ADJUST BY COMPRESSING OR EXPANDING COIL SLIGHTLY FOR MAXIMUM OUTPUT COINCIDING WITH 88 MC. ON DIAL.
9	F M		108 MC.	108 MC. ON DIAL.		C1 (OSCILLATOR TRIMMER) FOR MAXIMUM OUTPUT.
10	F M	REPEAT STEPS 8 AND 9 UNTIL OSCILLATOR RANGE IS 88MC. TO 108MC. ON DIAL.				
11	F M		98 MC.	RESONANCE APPROXIMATELY 98 MC ON DIAL.		*L1*L2, ADJUST COMPRESSING OR EXPANDING COIL SLIGHTLY FOR MAXIMUM OUTPUT. *
12	A M	USE RADIATED SIGNAL (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP).	1500 KC	1500 KC ON DIAL		C2 (OSCILLATOR TRIMMER) FOR MAXIMUM OUTPUT.
13	A M					C3 (ANTENNA TRIMMER) FOR MAXIMUM OUTPUT.
14	A M		600 KC.	RESONANCE APPROXIMATELY 600 KC. ON DIAL.		CHECK THAT 600 KC. RESONANCE CORRESPONDS WITH 600 KC. POINT ON DIAL.
* THESE ADJUSTMENTS ARE PERMANENTLY SET AT THE FACTORY AND NORMALLY DO NOT REQUIRE READJUSTMENT UNLESS THEY ARE DISPLACED OR REPLACED IN SERVICING.						

OLYMPIC MODEL 584

Schematic Diagram Courtesy of Olympic Radio & Television Div.



REF. NO.	PART NO.	DESCRIPTION
		RESISTORS & CONDENSERS
R1	561	3.9 Ohm 1 Watt
R2, R30		33K Ohm 1/2 Watt
R3, R7, R23, R25		470K Ohm 1/2 Watt
R4, R4A	427B	100K Ohm Dual Control (Bass)
R5, R5A	427A	7500 Ohm Dual Control (Treble)
R6, R24		82 Ohm 2 Watt
R8, R22		24K Ohm 1/2 Watt
R9, R21		2200 Ohm 1/2 Watt
R10, R20		4700 Ohm 1/2 Watt
R11, R12, R14, R17, R18, R19		270K Ohm 1/2 Watt
R13, R16		22K Ohm 1/2 Watt
R15, R15A	434	3 Meg Dual Bal.-Loud. Control
R26	651	90 Ohm 10W with UCL82 Tubes
R27		10K Ohm 1/2 Watt
R28	604C	120 Ohm 5 Watt
R29	649	10 Ohm Fuse Type
C1, C8	906	.005 Discap
C2, C3, C6, C7		.05 MFD 200V DC

REF. NO.	PART NO.	DESCRIPTION
		RESISTORS & CONDENSERS
C4, C5, C12		.05 MFD 400V DC
C9, C10		.1 MFD 200V DC
C11	830A	2 MFD 50V Condenser
C1A, B, C	1018	80/40/20 150V DC Filter
		MISCELLANEOUS
J1	1948	Output Extension Speaker Jack
T1	1214	Output Transformer
T2	1214A	Output Transformer
S3	107A	4 Prong Amphenol Socket
Rect. 1	2760	Silicon Rectifier 500 MA
SP1	2633B	8" Speakers
SP2	2633	3-1/2" Speakers
	1657	Dial Panel
	2462	Knob (Balance-Loudness)
	2438	Knob (Bass-Treble)
P1, P2	305	Single Prong Phono. Plug
P3	307C	4 Prong Amphenol Plug
S1, S2	104A	Single Prong Phono. Socket

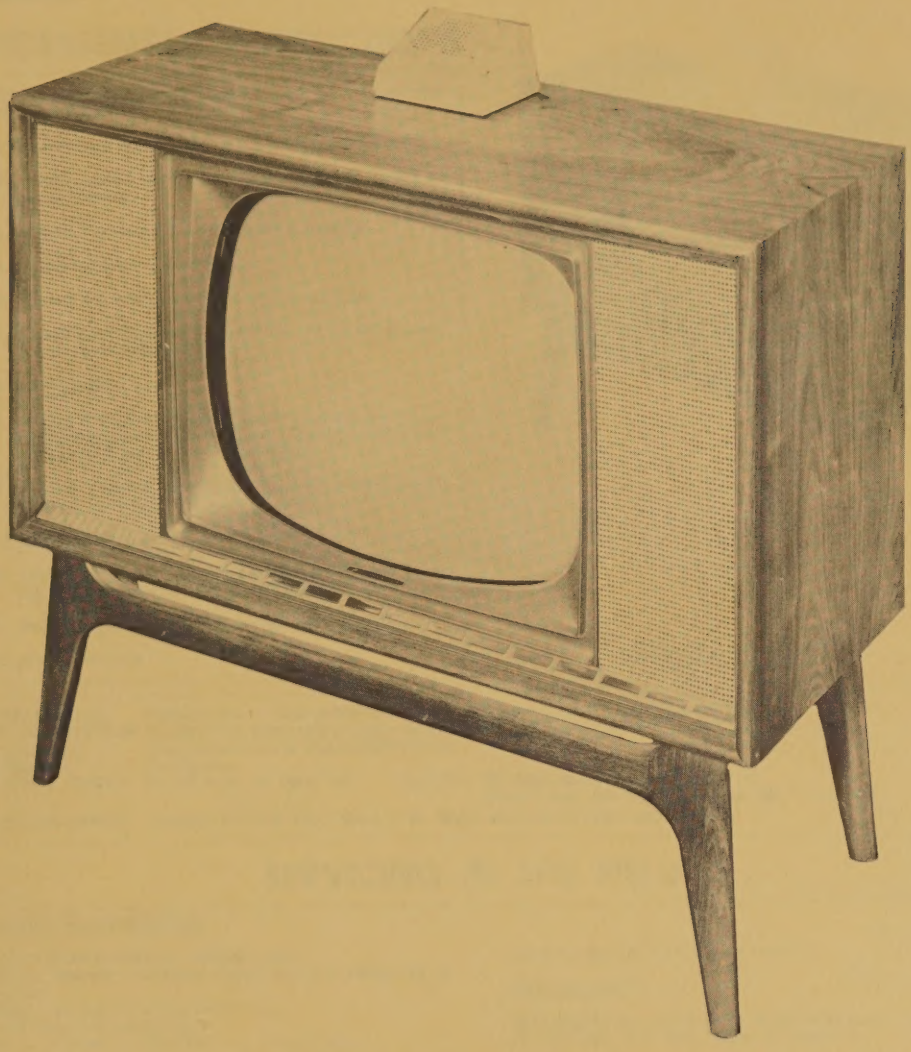
AIRLINE MODEL GAA-1081C

Schematic Diagram Courtesy of Montgomery Ward & Company

PHOTOFACT® Folder with CIRCUITRACE*

PACKARD-BELL
MODELS 21DC12, RM202 (Ch. 98D7)

PACKARD-BELL
MODELS 21DC12, RM202 (Ch. 98D7)



MODEL 21DC12 (Ch. 98D7)

PACKARD-BELL
MODELS 21DC12, RM202 (Ch. 98D7)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT® Folder with CIRCUITRACE®

PACKARD-BELL
MODELS 21DC12, RM202 (Ch. 98D7)

PACKARD-BELL
MODELS 21DC12, RM202 (Ch. 98D7)

DISASSEMBLY INSTRUCTIONS

NOTE: All under chassis components can be serviced while set is in cabinet:

1. Remove rear cover. (See Step 1, "Chassis Removal".)
2. Loosen 1 metal screw under tuner. Slide tuner back as far as possible.
3. Remove 1 chassis bolt at right bottom chassis.
4. Remove speaker and HV leads.
5. Chassis will now hinge out for access to parts.
6. Extentions for speaker and HV leads are needed to operate set while hinged out.

CHASSIS REMOVAL

1. Remove 6 wood and 1 metal screws holding rear cover. Remove antenna leads. Remove 3 push-on type knobs from rear of set. Remove rear cover.
2. Remove 2 remote control plugs, speaker leads, picture tube socket and HV lead.
3. Loosen yoke clamp.
4. Loosen 2 metal screws on upper left side of chassis holding chassis mounting bracket. Slide bracket down.
5. Remove 1 chassis bolt at lower right side of chassis.
6. Remove chassis.

MODEL 21DC12 (Ch. 98D7)

TRADE NAME	Packard-Bell Models 21DC12 (Ch. 98D7), Remote Control Unit Model RM 202
MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 So. Figueroa St., Los Angeles 7, Calif.
TYPE SET	Television Receiver with Remote Control
TUBES	Twenty-One
POWER SUPPLY	110-120 Volts, 60 Cycle AC RATING 225 Watts, 2.1 Amp. @ 117 Volts AC While Tuning 250 Watts. 2.4 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Press glass back firmly - bottom center.
Insert business card between glass and trim strips left of center.
Slide card to right to depress spring.
Lift trim strip straight up.
Remove glass by pulling tabs out - bottom edge.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see Thermal Switch on "Tube Placement Chart")

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner may be made from rear of set.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of an A.N.I. control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A14) located on bottom of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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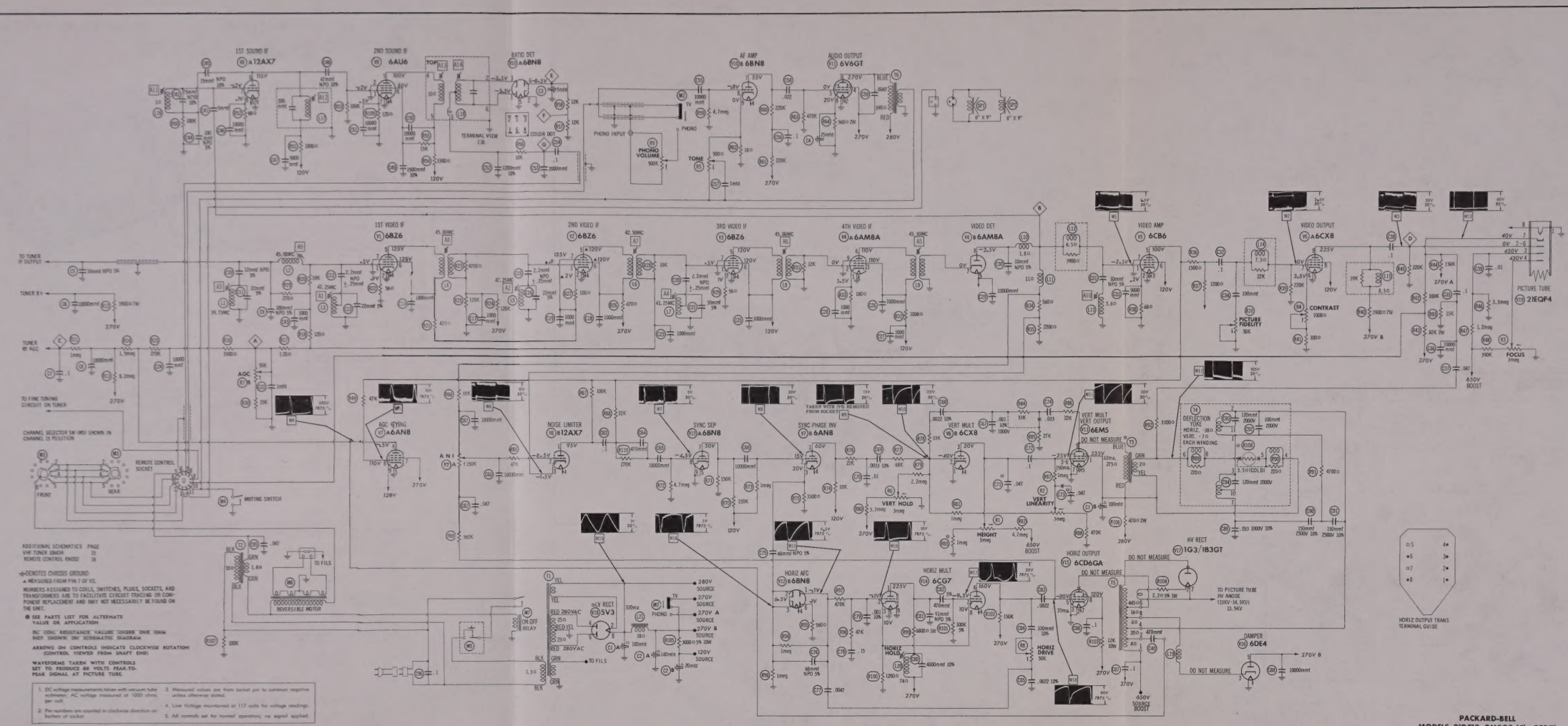
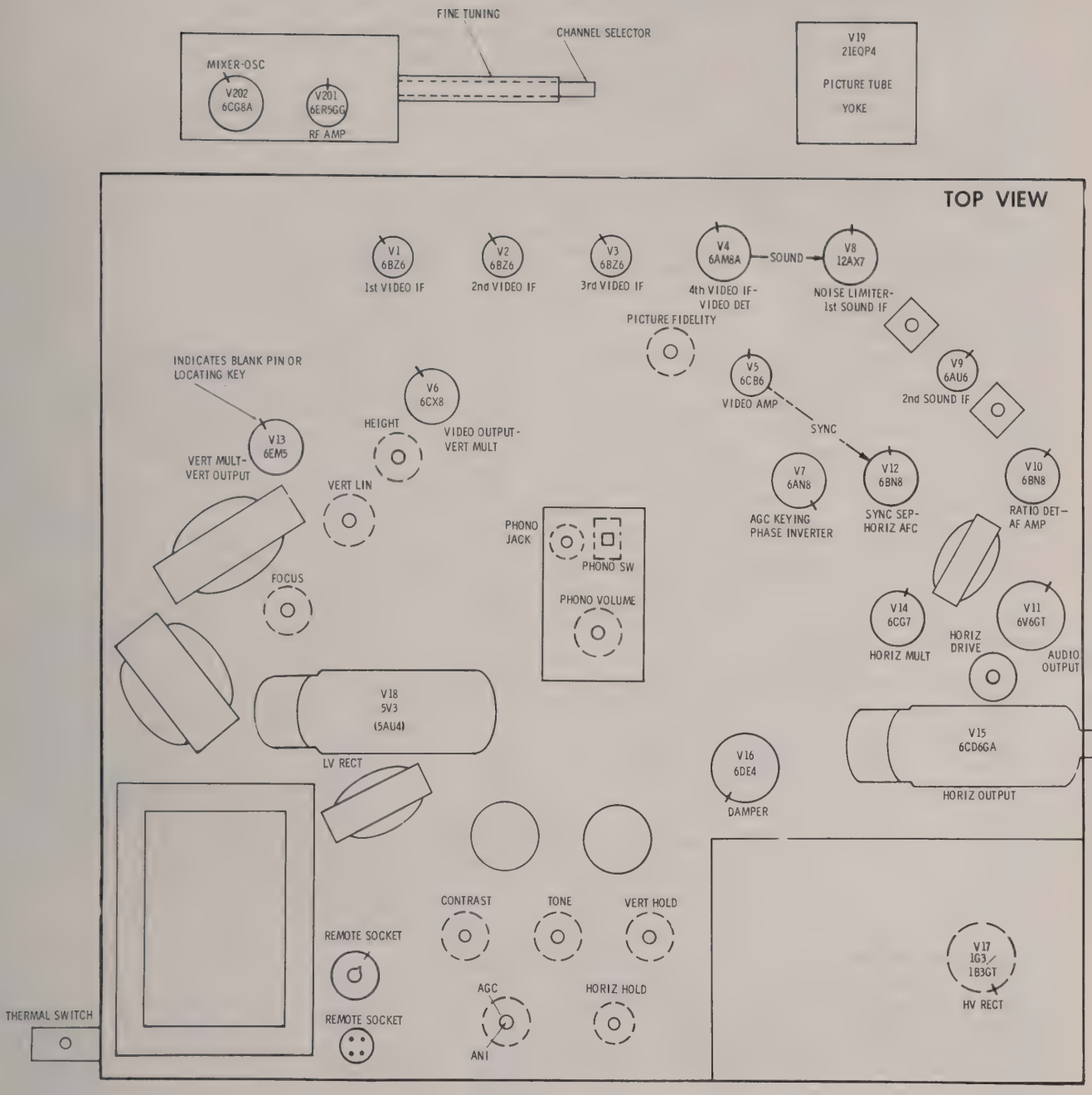
SET 469 FOLDER 1


1ST SOUND IF
V1 A 12AX7
2ND SOUND IF
V2 6AU6
RATIO DET
V3 B 6BN8
AF AMP
V10 B 6BN8
AUDIO OUTPUT
V11 6V6GT
1ST VIDEO IF
V1 6BZ6
2ND VIDEO IF
V2 6BZ6
3RD VIDEO IF
V3 6BZ6
4TH VIDEO IF
V4 A 6AM8A
VIDEO DET
V4 B 6AM8A
VIDEO AMP
V5 6CB6
VIDEO OUTPUT
V6 A 6CX8
PICTURE TUBE
V19 21EQP4
AGC KEYING
V7 A 6AN8
NOISE LIMITER
V8 B 12AX7
SYNC SEP
V7 B 6AN8
SYNC PHASE INV
V7 B 6AN8
VERT MULT
V6 B 6CX8
VERT MULT
VERT OUTPUT
V13 6EM5
HORIZ AFC
V12 B 6BN8
HORIZ MULT
V14 6CG7
HORIZ OUTPUT
V15 6CD6GA
HV RECT
V17 1G3/1B3GT
DAMPER
V16 6DE4
DEFLECTION YOKE
TUNER
AGC
CONTRAST
PICTURE FIDELITY
HEIGHT
VERT LINEARITY
HORIZ HOLD
HORIZ DRIVE
FOCUS
CHANNEL SELECTOR SW (#8) SHOWN IN CHANNEL 13 POSITION
REMOTE CONTROL SOCKET
MUTING SWITCH
REVERSIBLE MOTOR
ON-OFF RELAY
TO FILS
PHONO INPUT
PHONO VOLUME
TONE
TERMINAL VIEW
COLOR DOT
TAKEN WITH (V8) REMOVED FROM SOCKET
DO NOT MEASURE
TO PICTURE TUBE HV ANODE (13KV-16.5KV)
HORIZ OUTPUT TRANS TERMINAL GUIDE
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 20A5A 15
REMOTE CONTROL RM202 16
⊕ DENOTES CHASSIS GROUND
▲ MEASURED FROM PIN 7 OF V2.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
RESISTANCE VALUES UNDER ONE OHM MAY BE SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 60 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1960
PACKARD-BELL
MODELS 21DC12, RM202 (Ch. 98D7)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Thermal Switch, V18

SWEEP FAILURE
No raster, has sound V14, V15, V16, V17, V19
No vertical deflection V6, V13
Poor vert. linearity or foldover V6, V13
Poor horiz. linearity or foldover V14, V15, V16
Narrow picture V14, V15, V16, V18
Vert. off freq. V6, V13
Horiz. off freq. V12, V14

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V5, V6, V19
Has pic, no sound V8, V9, V10, V11
Overloaded picture V7

SYNC FAILURE
No vert. sync V7, V12
No horiz. sync V7, V12
No vert. or horiz. sync V7, V12

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A1 thru A9, A11 .... GENERAL CEMENT #8721, 8722
WALSCO #2519
A10 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A13, A14 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil ... GENERAL CEMENT #9296. 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Remove Noise Limiter tube from its socket.
Connect the negative lead of a 6 volt bias supply to point (A). Positive to chassis.
The geneator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	47.25MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load)	A1, A2	Set generator output at maximum. Adjust for MINIMUM deflection.
2.		"	39.75MC	"	"	A3	"
3.		"	41.25MC	"	"	A4	"
4.		"	43.3MC	"	"	A5	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
5.		"	45.0MC	"	"	A6	"
6.		"	42.5MC	"	"	A7	"
7.		"	45.75MC	"	"	A8	"
8.		"	43.0MC	"	"	A9	"
9.		"	45.0MC	"	"	Mixer Plate Coil	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect high side of a separate signal generator to ground lead of IF input cable to provide markers. DO NOT connect low side of generator.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	41.25MC 43.0MC 45.0MC 45.75MC 47.25MC	3	Vert. Amp. thru 22K to point (B). Low side to chassis. DC probe of VTVM to point (C). Common to chassis.		Adjust sweep output to develop -4 volts or less on AGC line as indicated by VTVM. Check for response curve similar to Fig. 1 with markers as shown. If necessary, retouch Mixer Plate Coil to position 45.75MC marker at 50%, A7 to position 43.0MC marker at corner of curve and A8 and A5 for correct tilt, dip or hump. A8 will affect higher frequency part and A5 the lower frequency. Replace the Noise Limiter tube in its socket.

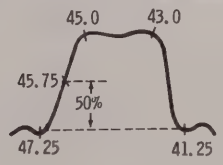
4.5MC TRAP ALIGNMENT

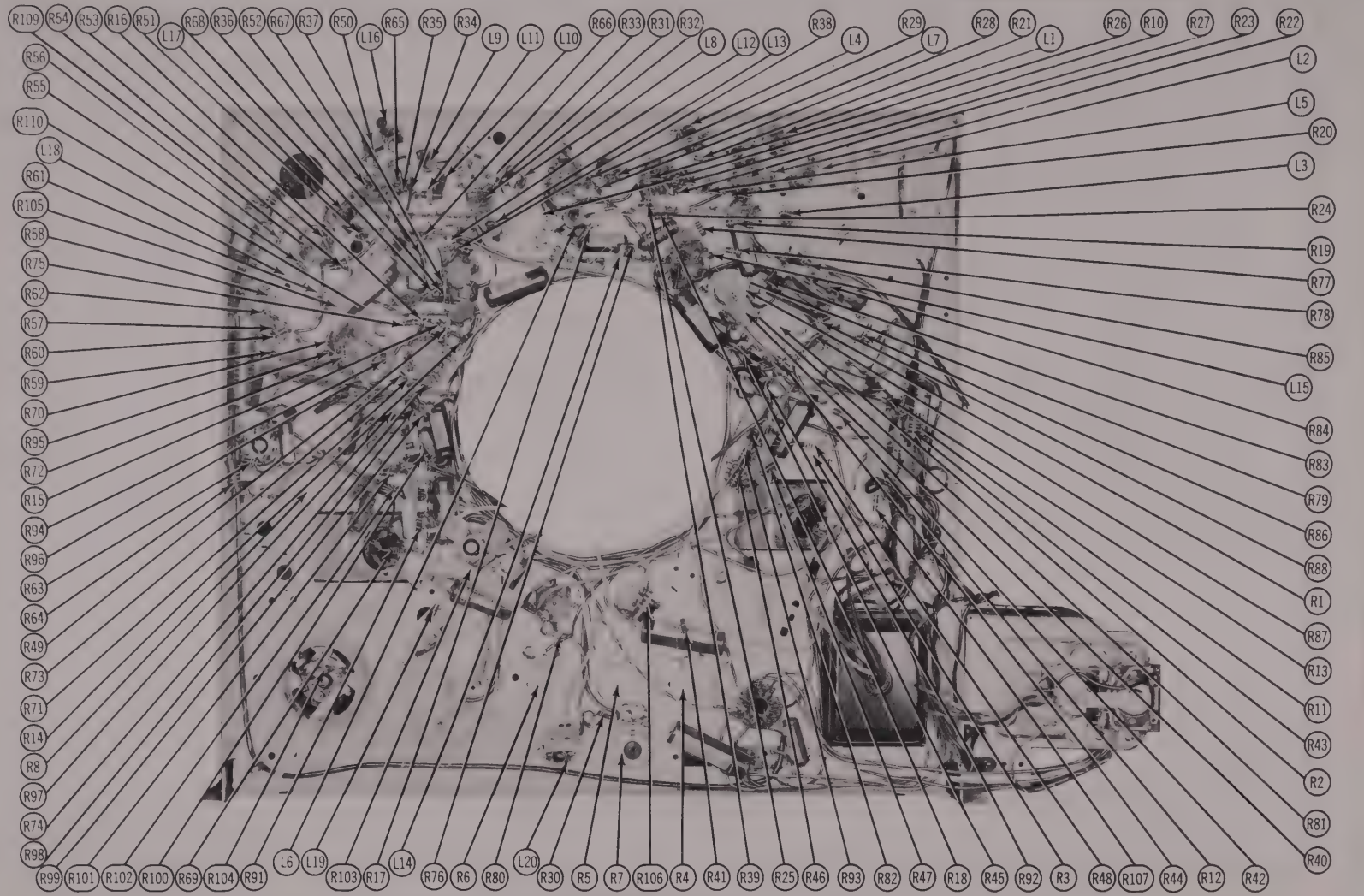
Remove Video Detector tube from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to point (D). Common to chassis.	A10	Adjust for MINIMUM deflection. Replace Video Det. tube in its socket.

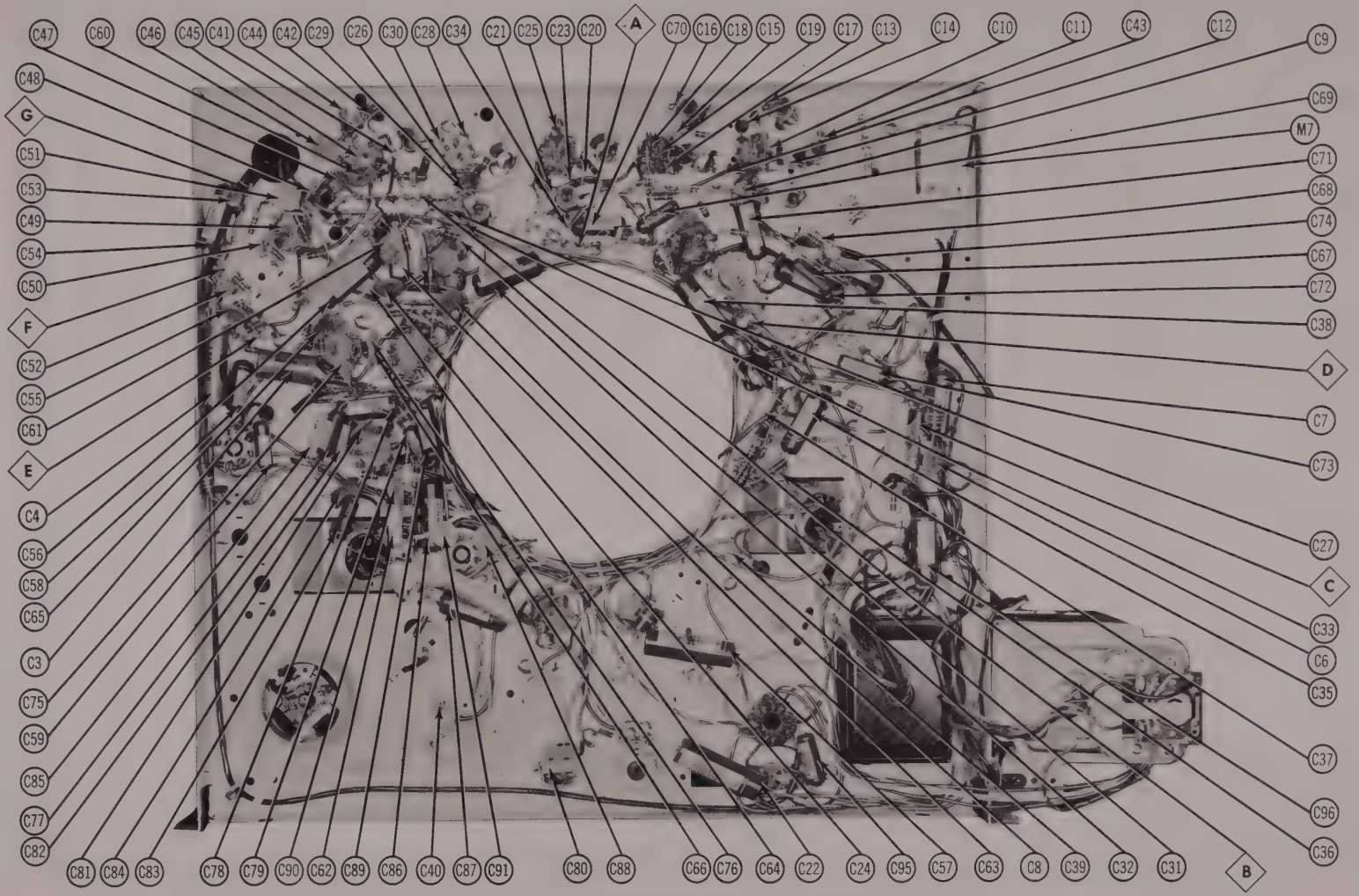
SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (E). Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
13.	"	"	"	"	DC probe to point (F). Common to point (G).	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

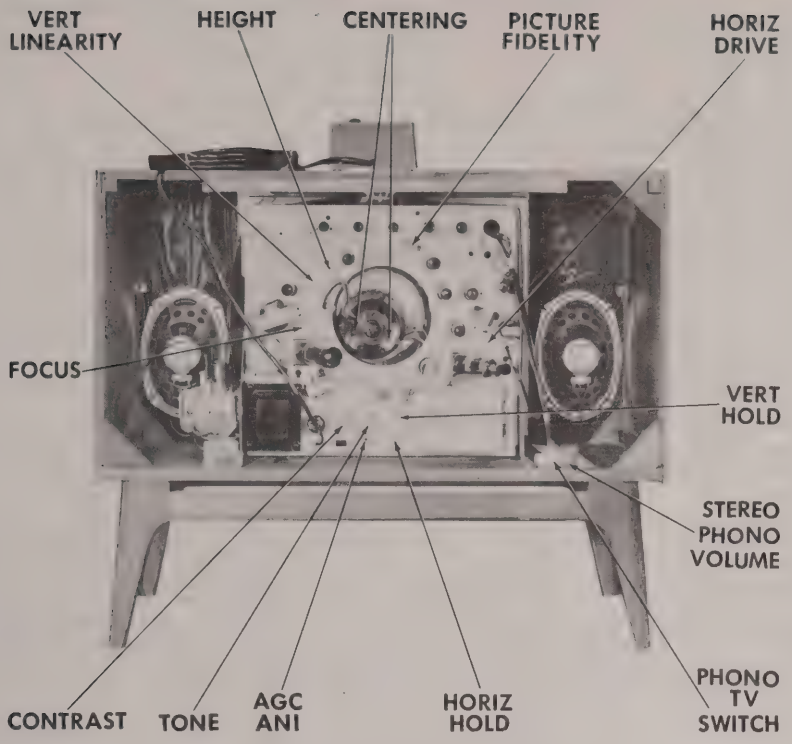




CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

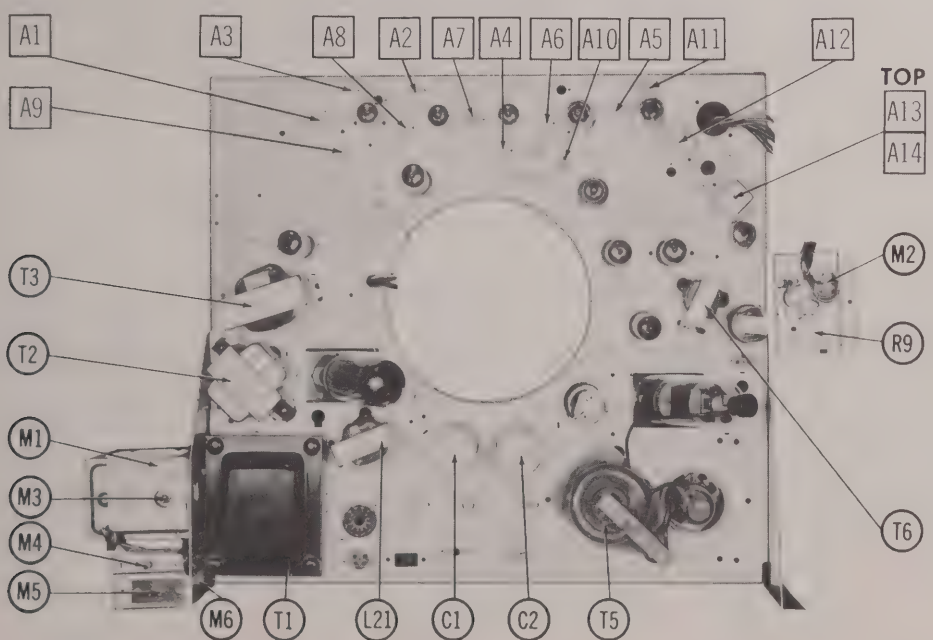
Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Turn the Horizontal Drive counterclockwise until drive lines appear near the center of screen and then clockwise until drive lines just disappear.



CHASSIS—TOP VIEW

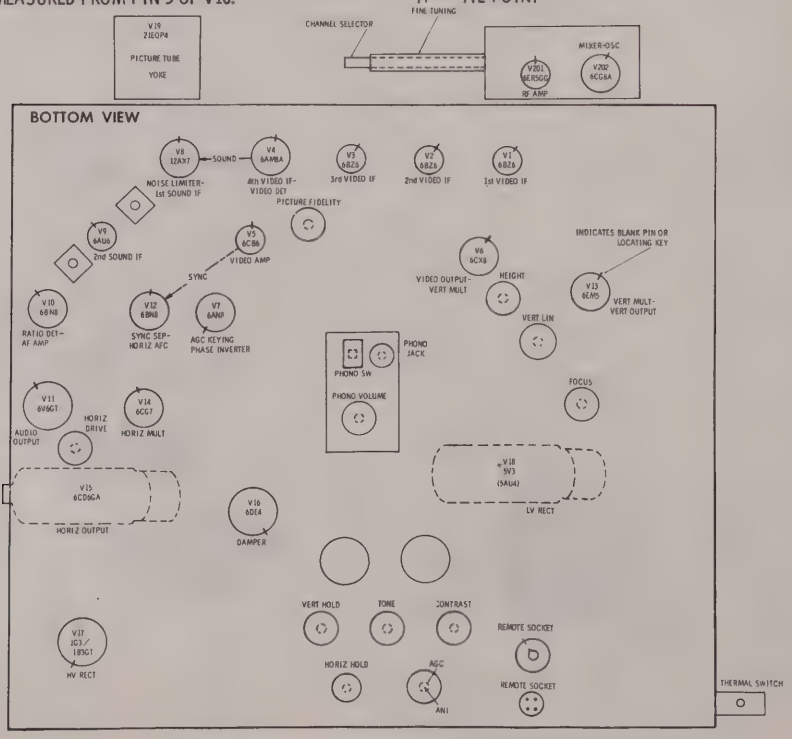
SET 469 FOLDER 1

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	•40K	56Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6BZ6	60K	▲ 100Ω	0Ω	.1Ω	† 470Ω	† 470Ω	INF		
V3	6BZ6	•40K	56Ω	0Ω	.1Ω	† 3000Ω	† 3000Ω	0Ω		
V4	6AM8A	180Ω	.1Ω	† 4000Ω	0Ω	.1Ω	† 4000Ω	.2Ω	2800Ω	0Ω
V5	6CB6	2800Ω	68Ω	.1Ω	0Ω	† 5700Ω	† 3000Ω	0Ω		
V6	6CX8	0Ω	• 2meg	• ‡3.3meg	.1Ω	0Ω	•250Ω	220K	† 3000Ω	† 3900Ω
V7	6AN8	† 13K	† 1meg	3300Ω	.1Ω	0Ω	• 300K	† 38Ω	† 50K	† 3000Ω
V8	12AX7	† 100K	• 140K	2200Ω	.1Ω	.1Ω	† 4000Ω	100K	68Ω	0Ω
V9	6AU6	100K	0Ω	0Ω	.1Ω	† 6300Ω	† 21K	120Ω		
V10	6BN8	INF	0Ω	INF	.1Ω	0Ω	24K	† 440K	4.7meg	18Ω
V11	6V6GT	TP	.1Ω	† 390Ω	† 38Ω	470K	TP	0Ω	560Ω	
V12	6BN8	2meg	1meg	1meg	.1Ω	0Ω	560Ω	† 80K	4.7meg	0Ω
V13	6EM5	† 470Ω	NC	• 2.8meg	0Ω	.1Ω	2.8meg	0Ω	NC	† 750Ω
V14	6CG7	† 6800Ω	2.5meg	1200Ω	.1Ω	0Ω	•† 150K	100K	1200Ω	0Ω
V15	6CD6GA	TP	0Ω	0Ω	NC	750K	NC	.1Ω	† 12K	TOP CAP ‡16Ω
V16	6DE4	NC	TP	¶ 2meg	NC	† 38Ω	NC	.1Ω	0Ω	
V17	1G3 1B3GT		PINS	1 THRU 8	HAVE	INFINITE RESISTANCE				TOP CAP ‡460Ω
V18	5V3	NC	¶	NC	25Ω	NC	23Ω	NC	¶	
V19	21EQP4	0Ω	220K	‡1meg	■ ‡800K	NC	220K	• 140K	.1Ω	
V201	6ER5 GG	0Ω	2.8meg	.1Ω	0Ω	† 4900Ω	0Ω	0Ω		
V202	6CG8A	10K	† 16K	0Ω	0Ω	.1Ω	† 4900Ω	† 26K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 280V SOURCE.
‡ MEASURED FROM PIN 3 OF V16.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

TUNER PARTS LIST AND DESCRIPTIONS

10643A

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V201	RF Amp.	6ER5GG

ITEM No.	USE	TYPE
V202	Mixer-Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	30							
C202	28			TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	1.8-7.0			829-7				
C205	100		EF-0001	MFT-100				
C206	.5-3.5							
C207	.6-3.5							
C208	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C209	.5 10%		NPO-SI .5	TCZ-R5				
C210	1000		EF-001	MFT-1000		CCF-102	CT280A	
C211	2.0 N1500 10%							
C212	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C213	8.2 NPO ±.5mmf		NPO-DI 8.2		C10V82C			10TCC-V82
C214	3.0 NPO 10%		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V3
C215	3.6 NPO ±.25mmf							
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	1000Ω	
R203	2700Ω	

ITEM No.	RATING	REMARKS
R204	220K	
R205	22K	
R206	1000Ω	

ITEM No.	RATING	REMARKS
R207	12K	
R208	10K	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Packard-Bell PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M201	1N87		1N60	1N82A	1N82A	Fine Tuning

TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC — USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp	6BZ6
V3	3rd Video IF Amp.	6BA6
V4	4th Video IF Amp.- Video Det.	6AM8A
V5	Video Amp.	6CB6
V6	Video Output-Vert. Mult.	6CX8
V7	AGC Keying-Sync Phase Inverter	6AN8
V8	Sound IF Amp - Noise Limiter	12AX7

ITEM No	RAYTHEON — USE	TYPE
V9	2nd Sound IF Amp.	6AU6
V10	Ratio Det -AF Amp.	6BN8
V11	Audio Output	6V6GT
V12	Sync Sep.-Horiz. AFC	6BN8
V13	Vert Mult -Vert Output	6FM5
V14	Horiz. Mult.	6CU7
V15	Horiz. Output	6CD6GA
V16	Damper	6DE4
V17	HV Rect	1G3 1B3GT
V18	LV Rect	5V3 -5AL4) *

ITEM No	SYLVANIA — USE	TYPE
V9	2nd Sound IF Amp.	6AU6
V10	Ratio Det -AF Amp.	6BN8
V11	Audio Output	6V6GT
V12	Sync Sep.-Horiz. AFC	6BN8
V13	Vert Mult -Vert Output	6FM5
V14	Horiz. Mult.	6CU7
V15	Horiz. Output	6CD6GA
V16	Damper	6DE4
V17	HV Rect	1G3 1B3GT
V18	LV Rect	5V3 -5AL4) *

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: Packard-Bell PART No	GENERAL ELECTRIC PART No	RCA PART No	RAYTHEON PART No	SYLVANIA PART No	NOTES
V19	21FQP4		21EQP4 ①		21EQP4 ②	① Aluminized ② "Silver Screen 95"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	±100	350	24186	AF62-41-50	B0332	FP227 7	TMS-51 TD-100-450	TVL-2541	
B	±100	350							
C2A	±140	350	24185	AF23-29-75	D0044	FP232 8	TMS-53 TD-30-350	TVL8-2543 *	
B	±20	350							
C3	5	50	24035	PRS2S10	BBR5-50	TT50X5	TD-5-50	TVA-1503	
C4	35	35	24006A	PRS1S80	BBR35-35	TC36	TD-35-25	TVA-1205	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No	MALLORY PART No	SPRAGUE PART No
C5	10 NPO 5%		NPO-DI 10	DTZ-10	CD0Q1C	CM-15E-100J	CNO-410	10TCC-Q10
C6	10000		BPD-01	BYA10I	CCD-103	B-10	B-10	5HK-S10
C7	1 200V		P288N-1	DF-104	CUB2P1	2DP-2-104	GEM-201	2TM-P1
C8	10000		BPD-01	BYA10E	CCD-103	B-110	B-110	5HK-S10
C9	100 NPO 5%			TCZ-100	C10T1C	CM-15E-101J	CNO-210	10TCC-T10
C10	12 NPO 5%			DTZ-12	C10T12C	CM-15E-130J	CNO-413	10TCC-Q13
C11	22 5%		1469-000022	DTZ-23	22RS Q23	CM-20B-220J	CNO-422	MS-422
C12	2 2 NPO ± .25mmf		NPO-DI 2. 2	DTZ-2R2	C10V2RC		CNO-523	10TCC-V23
C13	22 5%		1469-000022	DTZ-22	22RS Q22	CM-20B-220J	CNO-422	MS-422
C14	1000		BPD-001	BYA001E	CCD0-102	B-210	B-210	5HK-D10
C15	NPO-DI 2. 2		NPO-DI 2. 2	DTZ-2R2	C10V2RC		CNO-523	10TCC-V23
C16	22 5%		1469-000022	DTZ-22	22RS Q23	CM-20B-220J	CNO-422	MS-422
C17	1000		BPD-001	BYA001E	CCD0-102	B-210	B-210	5HK-D10
C18	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C19	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C20	2 2 NPO ± .25mmf		NPO-DI 2. 2	DTZ-2R2	C10V2RC		CNO-523	10TCC-V23
C21	20 5%		1469-00022	TCZ-20	22RS Q3	CM-20B-200J		MS-43
C22	1mfd 100V		P288N-1.0		CUB3W1		GEM-21	2TM-M1
C23	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C24	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C25	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C26	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C27	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C28	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C29	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C30	10 NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CM-15E-100J	CNO-410	10TCC-Q10
C31	10 NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CM-15E-100J	CNO-410	10TCC-Q10
C32	1 600V		P488N-1	DF-104	CUB8P1	6DP-4-104	GEM-601	6TM-P1
C33	5000		BPD-005	BD-502	BYA0D5	CCD-502	B-250	5HK-D50
C34	330		BPD-00033	BD-331	L10T33	CCD-331	B-333	5GA-T33
C35	1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C36	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C37	047 500V		P668N-047	BD-503	CUB5S47	6DP-3-473	GEM-6147	6TM-S47
C38	1 600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C39	01 600V		P668N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C40	470		BPD-00047	BD-471	BYA0D47	CCD-471	B-347	5GA-T47
C41	5		SI 5	D6-050	L40Y5	CCD-050	GP550	10TR-Y50
C42	75 N750 10%		N750-DI 75	DTN-75	C10Q75U	CCTN-750	CN7-475	10TCC-Q75
C43	1000		BPD-001	BD-102	BYA10DI	CCD-102	B-210	5HK-D10
C44	100 NPO 5%			TCZ-100	C10T1C	CM-15E-101J	CNO-210	10TCC-T10
C45	15 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-416	10TCC-Q15
C46	1000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C47	5000		BPD-005	BD-502	BYA0D5	CCD-502	B-250	5HK-D50
C48	NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C49	1500 10%		DE-1500	D6-152	P468D15	CCD-152	GP215	10TD-D15
C50	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C51	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C52	1200 10%		DI-1200	BD-122	P468D1	CCD-122	GP212	10TD-T12
C53	2000		BPD-002	BD-202	UR5D2	CCD-202	B-220	5HK-D20
C54	1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C55	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C56	1 800V		P688N-1	DF-104	CUB8P1	6DP-4-104	GEM-601	6TM-P1
C57	1mfd 100V		P288N-1.0		CUB3W1		GEM-21	2TM-M1
C58	.022 400V		P488N-022	BD-303	CUB4S22	4DP-3-223	GEM-4122	4TM-S22
C59	.0047 500V		P668N-0047	D6-472	P468D47	6DP-1-472	GEM-6247	6TM-D47
C60	10000		BPD-01	BD-103	BYA10SI	CCD-103	B-110	5HK-S10
C61	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C62	.047 200V		P288N-047	BD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C63	1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C64	470		BPD-0047	BD-471	BYA0D47	CCD-471	B-347	5GA-T47
C65	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C66	10000		BPD-01	BD-103	BYA10E	CCD-103	B-110	5HK-S10
C67	001 1000V 10%		P1084CM-0012	DD-102		1B0P-1-102	GP210	10TM-D1
C68	.0022 400V 10%		V84C4D22-10%		P468D22	6DP-1-222	GP222	6TM-D22
C69	.0033 500V 10%		V84S5D33-10%		P468D33	6DP-1-332	JL-323	6TM-D33
C70	.01 600V		P668N-01	D6-103	CUB6S1	6DP-2-203	GEM-611	6TM-S1

FIXED CAPACITORS (cont)

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No	MALLORY PART No	SPRAGUE PART No
C71	.047 600V	Note 1	P668N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-D47
C72	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C73	.047 200V	Note 2	P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C74	.033 600V		P668N-033	DD-333	CUB6S33	6DP-3-333	GEM-6033	6TM-S33
C75	68 NPO 5%			DTZ-68	C10Q68C	CM-15E-680J	CNO-468	10TCC-Q68
C76	68 NPO 5%			DTZ-68	C10Q68C	CM-15E-680J	CNO-468	10TCC-Q68
C77	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6147	6TM-D47
C78	15 200V		P388N-1		CUB3P15	3DP-3-154	GEM-3015	3TM-P15
C79	.001 500V 10%		V84C8D1-10%	DD-102	P.M6D1	6DP-1-102	GP210	6TM-D1
C80	4000 10%		1464-004		UR3D4	CCD-392	MCB463	MS-24
C81	NPO 5%			TCZ-91	C10Q91C	CM-15E-910J		MS-491
C82	470 5%		1469-00047		22RS Q47	CM-20B-470J	MCJ244	MS-347
C83	.0033 600V		P668N-0033	D6-332	CUB6D33	6DP-1-332	GEM-622	6TM-D33
C84	330 10%		1469-00033	D6-331	22RS733	CM-20B-331K	MCB241	MS-333
C85	.0033 400V 10%		V84C4D33-10%		P.M6D33	6DP-1-332	GP222	4TM-D33
C86	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C87	1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C88	10000		BPD-01	BD-103	BYA10SI	CCD-103	B-110	5HK-S10
C89	033 1000V 10%	#23509	P1084CM-033	DD-303		1B3P-4-333	GEM-1813	10TM-S33
C90	150 2500V 10%	#23509						
C91	150 2500V 10%	#23509						
C92	100 2000V			DD80-101	HVB3071	VCM-20-101M	2HV-310	30GA-T10
C93	120 2000V			DD80-121	HVB3071Z	VCM-20-121M	2HV-312	30GA-T12
C94	120 2000V			DD80-121	HVB3071Z	VCM-20-121M	2HV-312	30GA-T12
C95	.047 200		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C96	.1 600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1

Packard-Bell Part Number.
Note 1. Some versions may use .033mfd @ 600V with Vert. Output Transformer (Part #8950l).
Note 2. Not used with Vert. Output Transformer (Part #8950l).

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg	½	25910	AB-87	B47-5meg-S	B11-141	PTA56L	Height
B	Shaft			AK-19	Not Req	TM4	Not Req	
R2A	3meg	½	25867	BX-84	B47-3meg-S	B11-140	TA36L	Vert. Lin
B	Shaft			Not Req.	Not Req.	TM1	Not Req.	
R3A	3meg	½	25867	BX-84	B47-3meg-S	B11-140	TA39L	Focus
B	Shaft			Not Req.	Not Req.	TM1	Not Req.	
R4A	1000Ω	½	25904A	B-505	A47-1000-S	Q27-105	U3	Contrast
B	Shaft			Not Req.	FKB-1/3	Not Req.	Not Req.	
R5	500Ω	½	25527					Tone
R6A	3meg	½	25984	BX-84	A47-3meg-S	Q11-140	U-59	Vert. Hold
B	Shaft			Not Req.	FKB-1/3	Not Req.	Not Req.	
R7A	150K	½	25968	F1-33		† (🔲)-981	■ GE39L2	A. N. I.
B	50K	½		R3-29				AGC
R8A	50K	½	25908	BX-31	B47-50K-S	B11-133	PTA54L	Horiz. Drive
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R9A	500K	½	25069	B-60	A47-500K-Z	Q33-153	U48	Phono Volume
B	Shaft			Not Req.	KSB-3	Not Req.	Not Req.	
R10A	50K	½	25968	B-32	A47-50K-Z	Q33-123	U33	Picture Fidelity
B	Shaft			Not Req.	KSB-3	Not Req.	Not Req.	

† "Concentrikit" Equivalent: K-8 Kit with Base Elements & Shafts: BU-328, P19-012 (Panel) BU-123, 1S-437 (Rear) 76-1 (Switch)

■ "STA-LOC" Equivalent: FB154L, RU54L, OS800, 15437.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R11	1meg	
R12	3300Ω TW	#73715
R13	8.2meg	
R14	1.5meg	
R15	270K	
R16	3300Ω	
R17	120Ω	
R18	120Ω	
R19	270Ω	
R20	10K	
R21	470Ω	
R22	56Ω	
R23	4700Ω	
R24	120K	
R25	120K	
R26	470Ω	
R27	100Ω	
R28	10K	
R29	56Ω	
R30	15K	
R31	12K	
R32	100Ω	
R33	180Ω	
R34	560Ω	
R35	220Ω	
R36	1500Ω	
R37	120Ω	
R38	56Ω	
R39	220K	
R40	3300Ω TW	#73715
R41	100Ω	
R42	100K	
R43	82K 2W	
R44	150K	

ITEM No.	RATING	REMARKS
R45	220K	
R46	3.3meg	
R47	1.5meg	
R48	390K	
R49	47K	
R50	100K	
R51	1000Ω	
R52	68Ω	
R53	100Ω	
R54	3300Ω	
R55	15K	
R56	10K	
R57	12K	
R58	12K	
R59	4.7meg	
R60	220K	
R61	220K	
R62	15Ω	
R63	470K	
R64	560Ω 2W	
R65	47K	
R66	33K	
R67	100K	
R68	22K	
R69	560K	
R70	150K	
R71	150K	
R72	4.7meg	
R73	1meg	
R74	10K	
R75	3300Ω	
R76	22K	
R77	68K	
R78	33K	

ITEM No.	RATING	REMARKS
R79	2.2meg	
R80	5.5meg	
R81	1meg	
R82	4.7meg	
R83	1meg	Note 1
R84	22K	
R85	47K	
R86	22K	
R87	1meg	
R88	470K	
R89	220Ω	
R90	220Ω	
R91	4700Ω	
R92	3300Ω	
R93	15K	
R94	1meg	
R95	560Ω	
R96	1meg	
R97	470K	
R98	470K	
R99	6800Ω 1W	
R100	1200Ω	
R101	100K 5%	
R102	150K	
R103	12K 10W	#73705
R104	2.2Ω 5% 1W	#73719
R105	3000Ω 5% 10W	#73720
R106	4700 2W	
R107	100K	
R108	2.5Ω COLD	Note 3
R109	120Ω	
R110	270K	

Packard-Bell Part Number.
Note 1. Some versions may use 470K with Vert. Output Transformer (Part #8950l).
Note 2. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Gremar PART No	Meissner PART No.	Merit PART No.	Miller PART No	Rem PART No	NOTES
L1	39.75MC Trap	29564A						
L2	1st Video IF	29684	17-4534	17-4534	TV-131		VF-4	
L3	47.25MC Trap	29564A						
L4	2nd Video IF	29685	17-4533	17-4533	TV-130	6219	VF-3	
L5	47.25MC Trap	29564A						
L6	3rd Video IF	29685	17-4533	17-4533	TV-130	6219	VF-3	
L7	41.25MC Trap	29565A						
L8	4th Video IF	29585	17-4533	17-4533	TV-130	6219	VF-3	
L9	5th Video IF	29587B	17-4533	17-4533	TV-130	6219	VF-3	
L10	RF Choke	29586	19-1005	19-1005	BC-586	4612		10uh
L11	Shunt Peaking Coil	29509	19-2350	19-2350	TV-185	6186	VP-6	250uh ②
L12	Series Peaking Coil	29562	19-3093 *	19-3093 *	TV-182 *	6177 *	VP-3 *	63uh ①
L13	4.5MC Trap	29548A				1470 a		
L14	Series Peaking Coil	29506		19-3125 a	TV-183	6178	VP-4 a	120uh ②
L15	Shunt Peaking Coil	29508	19-4180	19-4180	TV-183	6178	VP-5 a	180uh ②
L16	1st Sound IF	29582C			TV-119 a			
L17	2nd Sound IF	29576A						
L18	Ratio Detector	29694	17-3477	17-3477				
L19	RF Choke	23545						12uh

① Wound on 2900Ω resistor.
② Wound on 22K resistor.
③ Wound on 39K resistor.

* Parallel with 2200Ω resistor.
a Disregard tap.

■ Parallel with 22K resistor.
■ Parallel with 39K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Thordarson PART No.	NOTES
L20	74Ω		29703	HS-7	TV-185 a	6211 a	H-102	HS-7	Horiz. Stab. a Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT (1000 ⁻¹)	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No	Merit PART No	Rem PART No	Stancor PART No	Thordarson PART No	Triad PART No
L21	250A	38Ω	9 Hy	27006D	26C44	C-2996		C-2328	26C44	C-27X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No	Merit PART No	Rem PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117V ① 1.8A	680VCT ② 330A	5V ③ 3-6A	29078B	26R93	P-3085			26R93	R-77BC
	SEC 3	SEC 4	SEC 5							
	6.3V ④ 11A									

TRANSFORMER (MOTOR)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	117V ① 34A	24V ② 1.7A		29060B						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	Vert. Output	29480B	25S14		V319		VO-101	26S14	A-113X
T4	Alt. Vert. Output	29501							
	Yoke-Horiz. (10.5MH) (110°)-Vert. (55MH) Rear Cover & Centering Device	29698 ①	Y-82 ③		Y-110 ② ④		DY-37A	Y-82 ③	Y-80-2 ③
T5	Horiz. Output	29488A							YC-110 D-92 *

① Includes R89, R90, R108, C92, C93 and C94.
② Use original rear cover and centering device.
③ Connect same as original.
④ Connect yoke terminal #2 to horizontal output transformer terminal #4, yoke terminals #1 and #3 to R91, yoke terminal #10 to junction of C89 and C90.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Rem Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
6							8
5							6
4							5
3							4
2							3
1							1

PACKARD-BELL MODELS 21DC12, RM202 (Ch. 9807)

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	4500Ω	3-4Ω	89436D	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	
SP1	6" x 9"	PM	6-8Ω	83113	69A1Z6	
SP2	6" x 9"	PM	6-8Ω	83113	69A1Z6	

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M1	Tuner	10643A	VHF
M2	Switch	86712	Phono-TV (DPDT Slide Type)
M3	Switch	86077	Channel Selector (on motor)
M4	Switch	58067	Muting
M5	Switch	86718A	Circuit Breaker
M6	Motor	58067A	
M7	Relay	72018A	On-Off

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	55090A	
Mask	55120	
Knob	52217AS	Channel Selector
Knob	52220AS	Fine Tuning, Brightness, Contrast
Knob	52257	Contrast, Vert. Hold, Tone
Knob	52183A	Picture Fidelity
Knob	52220	Phono-Volume

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

REMOTE CONTROL

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C97	25	25	24006A	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R111A	50K	½	25040	B-32	A47-50K-Z	Q13-123	U33	Volume,Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On
R112A	50K	½	25917B	B-31	A47-50K-S	Q11-123	U35	Brightness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R113A	50K	½	25946	B-32	A47-50K-Z	Q13-123	U33	Fine Tuning
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

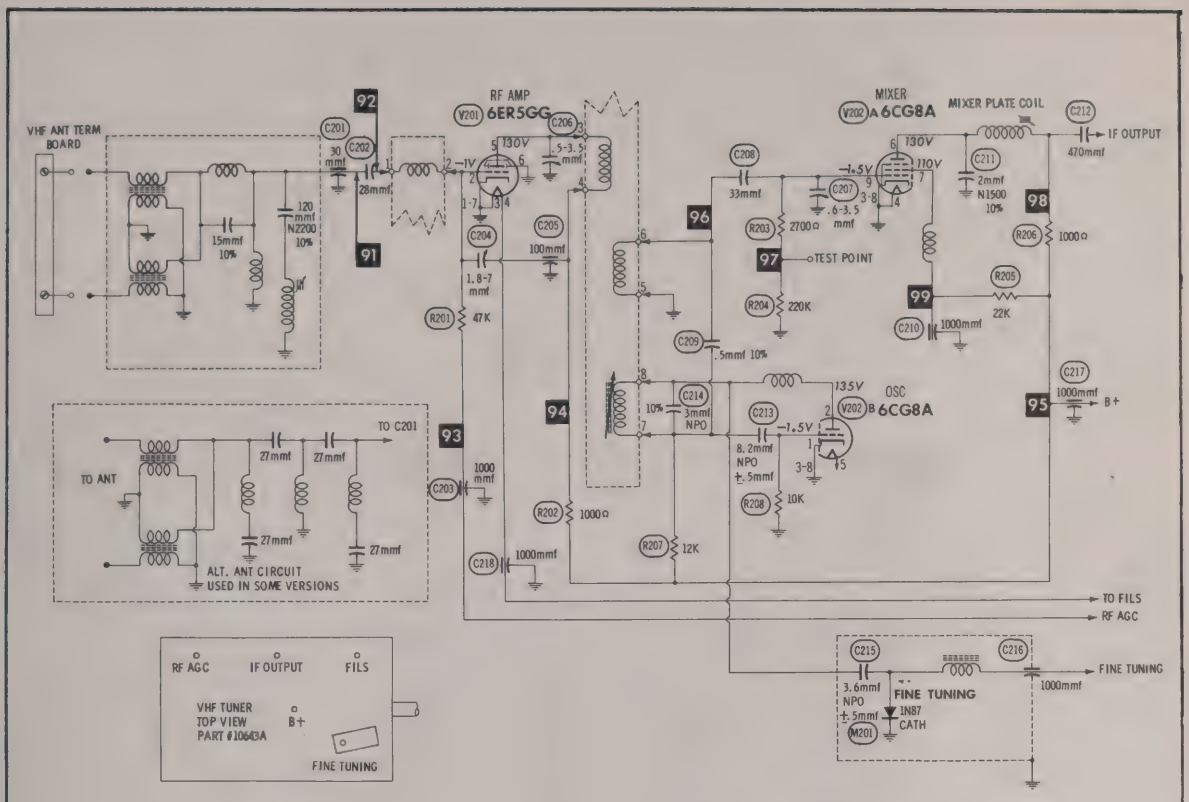
Note 1. Some versions may use 50K with Switch (Part #25083) in this application.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	
SP3	2½"	PM	3-4Ω	88114	25A07	

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M8	Switch	86063A	Channel Selector
M9	Switch	86714A	Speaker Selector



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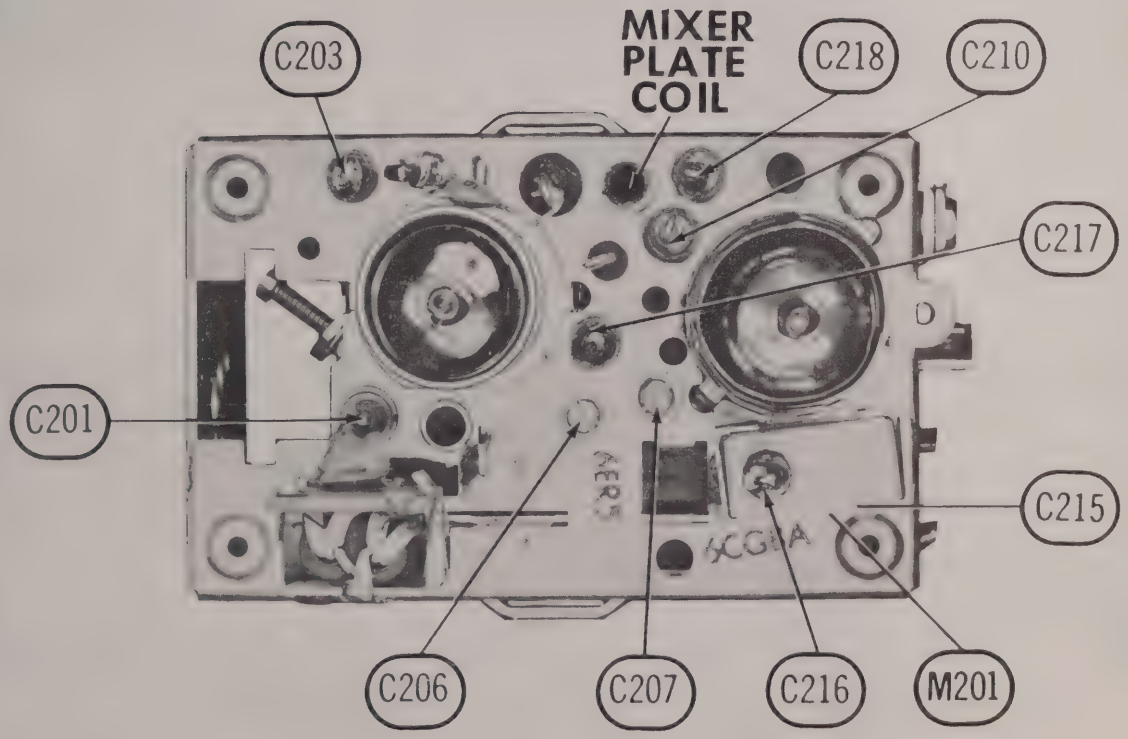
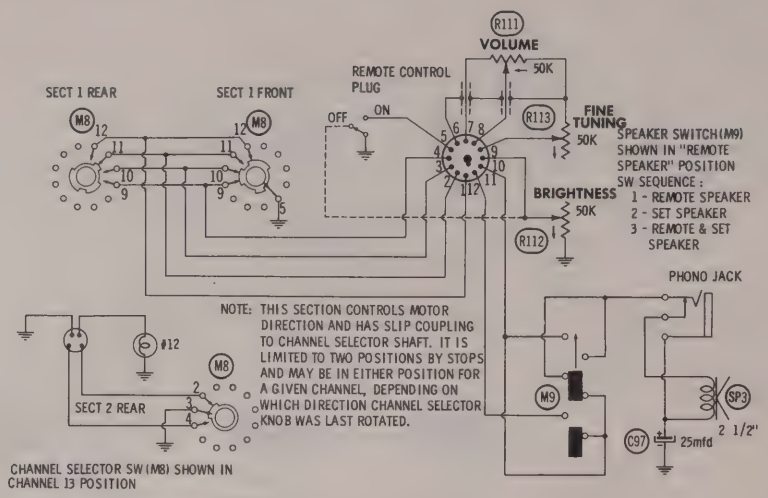
VHF TUNER 10643A



TUNER 10643A - TOP VIEW



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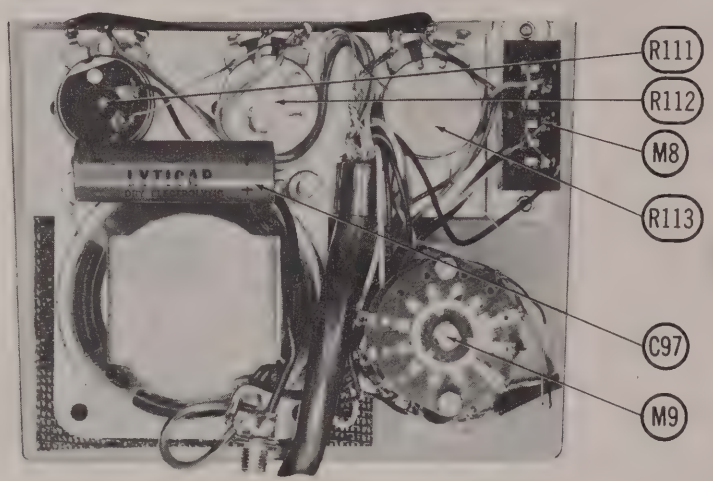
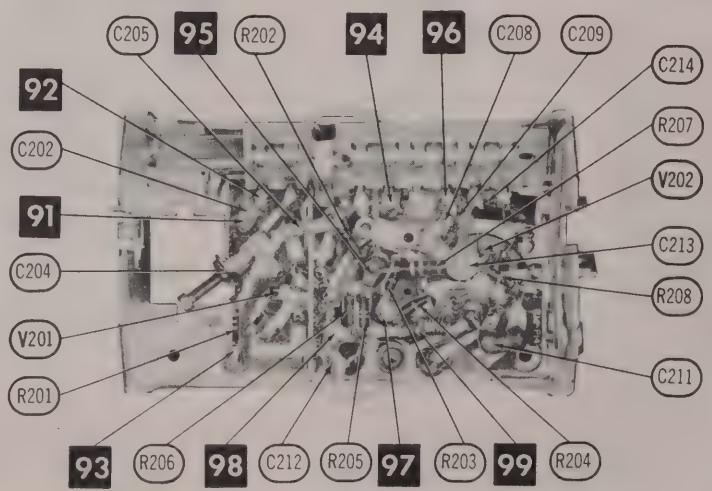
REMOTE CONTROL RM202



REMOTE CONTROL RM202



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TUNER 10643A BOTTOM VIEW

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

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ZENITH
CHASSIS 17D20, Q, U

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CHASSIS 17D20, Q, U

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MODEL D2464L (Ch. 17D3

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ZENITH
CHASSIS 17D20, Q, U

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 9 push-on type knobs from the front of cabinet.
2. Remove 8 wood screws and 1 metal screw holding rear cover. Remove rear cover.
3. Remove speaker leads, HiFi control plug, and tuner leads.
4. Remove 2 metal screws holding On-Off switch and Volume control.
5. Remove 2 bolts at rear top of cabinet holding the tuner mounting bracket. Remove tuner.
6. Remove 4 chassis bolts from bottom of cabinet.
7. Remove chassis.

MODEL D2464L (Ch. 17D20)

TRADE NAME	Zenith	MODELS	CHASSIS
		D2430E, R, W, D2458E, R, W, D2460M, R, D2462H, D2464L, W	17D20
		D2430EU, RU, WU, D2458EU, RU, WU, D2460MU, RU, D2462HU, D2464LU, WU	17D20U
		D3010E, H, R, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L	17D20Q
		Remote Control	S-46834 or S-46844
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	TV: VHF-Seventeen, UHF-Eighteen	Remote Control: Eight	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 200 Watts, 1.86 Amp. @ 117 Volts AC, less Remote Control	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 5 push-on type knobs from the front, and 4 metal screws holding front glass. Remove 2 screws holding trim. Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)
One fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner may be done from rear of set without removing back.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the 2 magnets so that all sides are straight.

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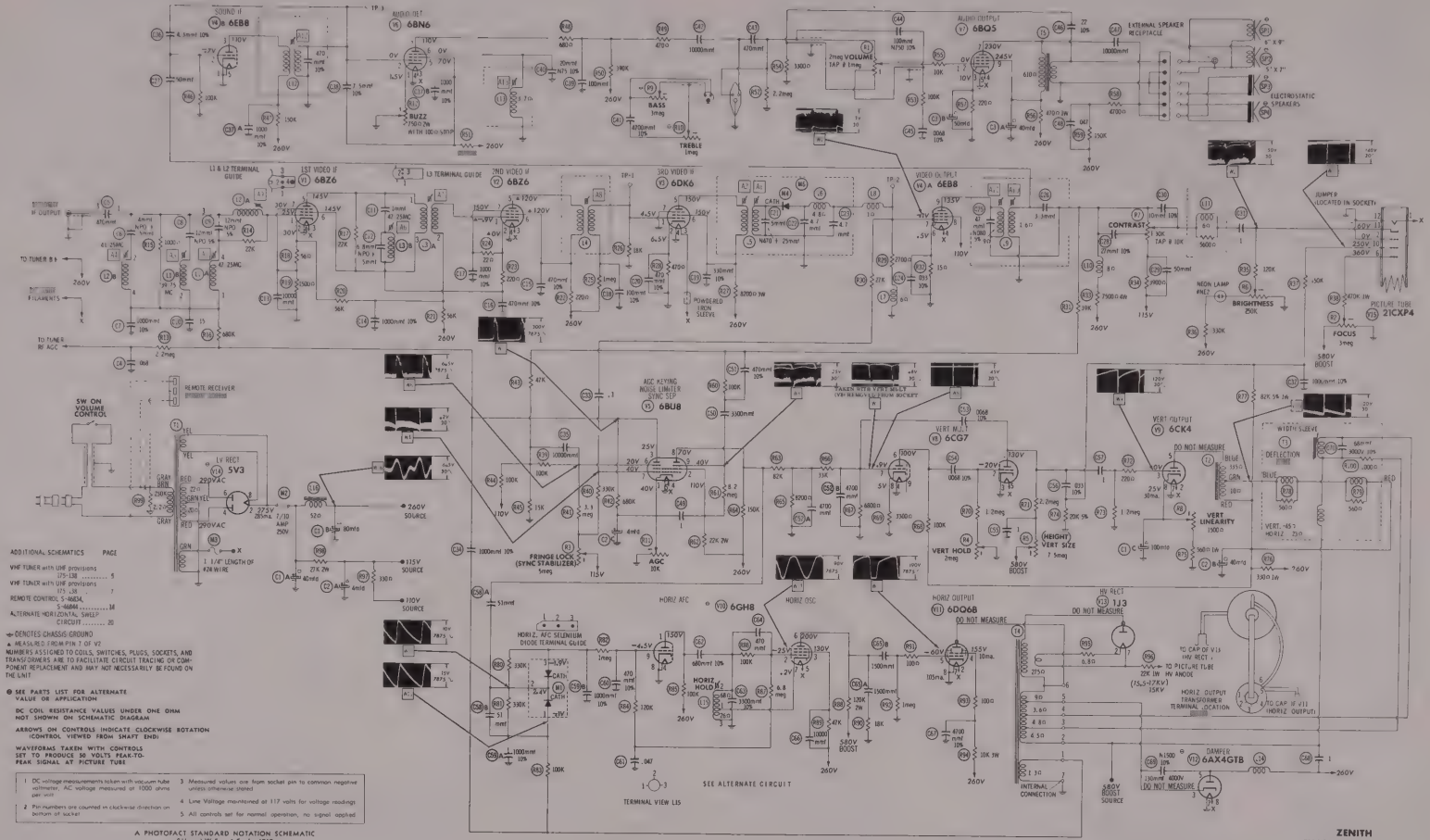
SET 469 FOLDER 2



ADDITIONAL SCHEMATICS PAGE

VHF TUNER with UHF provisions
175-138 5
VHF TUNER with UHF provisions
175-138 7
REMOTE CONTROL S-46E4 14
S-46B44 14
ALTERNATE HORIZONTAL SWEEP CIRCUIT 20

⏚ DENOTES CHASSIS GROUND

▲ MEASURED FROM PIN 7 OF V7

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

◉ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt

2 Pin numbers are counted in clockwise direction on bottom of socket

3 Measured values are from socket pin to common negative unless otherwise stated

4 Line Voltage maintained at 117 volts for voltage readings

5 All controls set for normal operation, no signal applied

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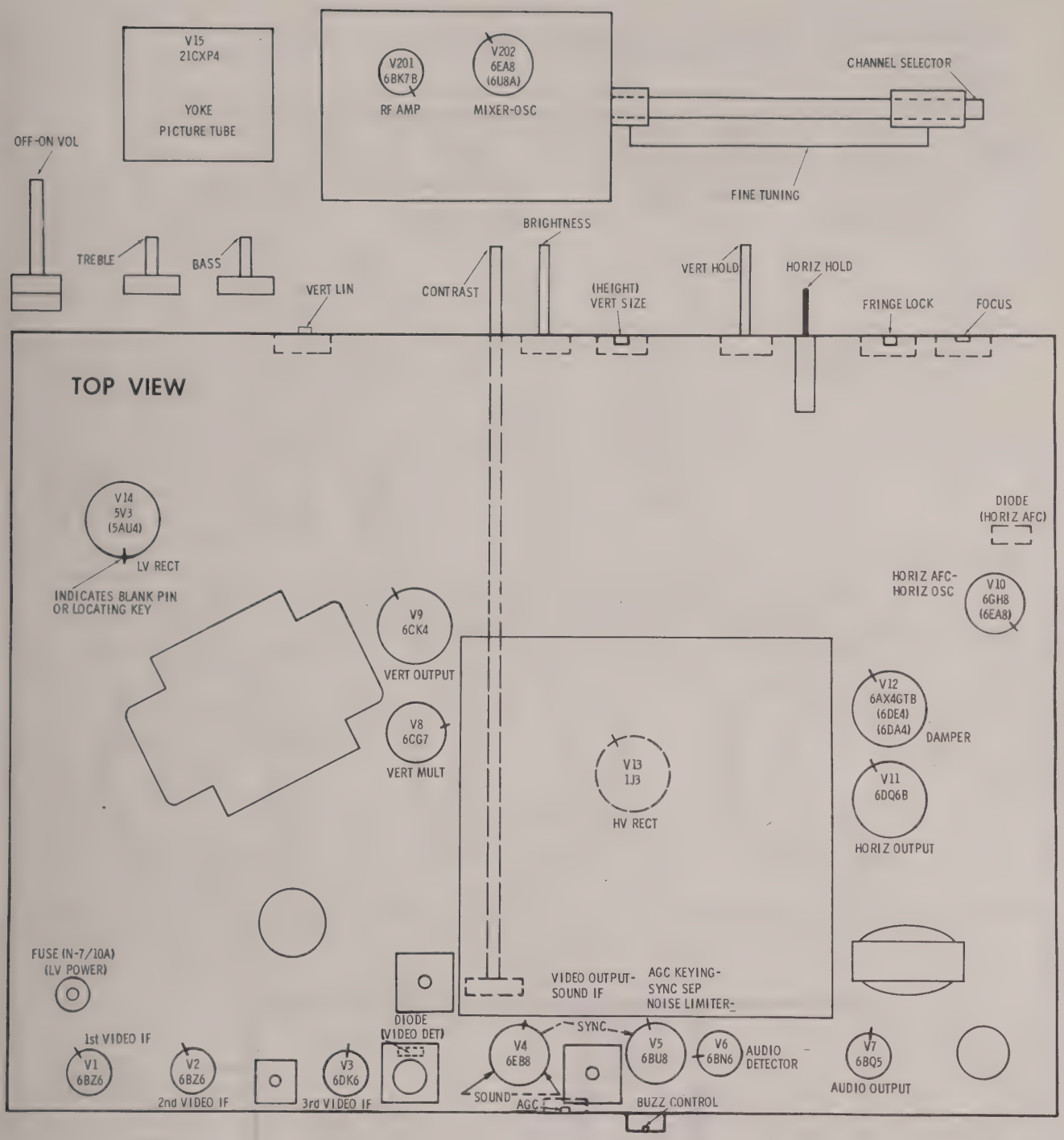
TUBE PLACEMENT CHART



ZENITH
CHASSIS 17D20, Q, U

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse 7/10 (LV Power), V14

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V15
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, V14
Vert. off freq. V8
Horiz. off freq. Diode (Horiz. AFC), V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5, Red (Horiz. AFC)
No vert. or horiz. sync V5

FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A1 thru A13. . . . General Cement #8606, 8606L, 8682, 9295
Walsco #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470mmf	High side to TP1. Low side to chassis. Connect a 56Ω carbon resistor across sweep output.	44MC (10MC Swp)	39.75MC 41.25MC 45.75MC	Between any two channels	Vert. Amp. thru 10K to TP2. Low side to chassis. (Across Video Det. load)	A1, A2	Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, check to see that the cores are entering their respective windings from opposite ends of the coils.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5, A6	Connect a clip lead from point Ⓐ to chassis. Connect a clip lead from TP3 to point Ⓑ. Use high scope again and adjust A3 thru A6 for MINIMUM marker amplitudes as in Fig. 2. A3 controls the 39.75MC marker, A4 controls the 41.25MC marker and A5 and A6 control the 47.25MC marker.
3.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A7, A8, A9, & Mixer Plate Coil	Remove clip lead from point Ⓑ and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A7 affects low side of curve and A8 affects the high side. Remove clip leads.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the 6BN6 as evidenced by a hiss similar to super-regeneration in the sound. Adjust A10, A11, A12 and A13 for maximum sound and best quality. Adjust the Buzz control for MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

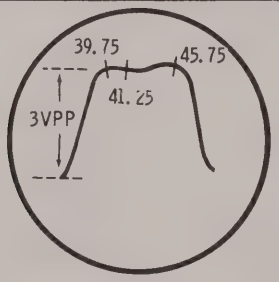


FIG. 1

FIG. 2

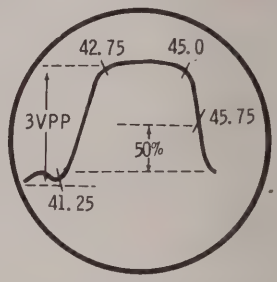
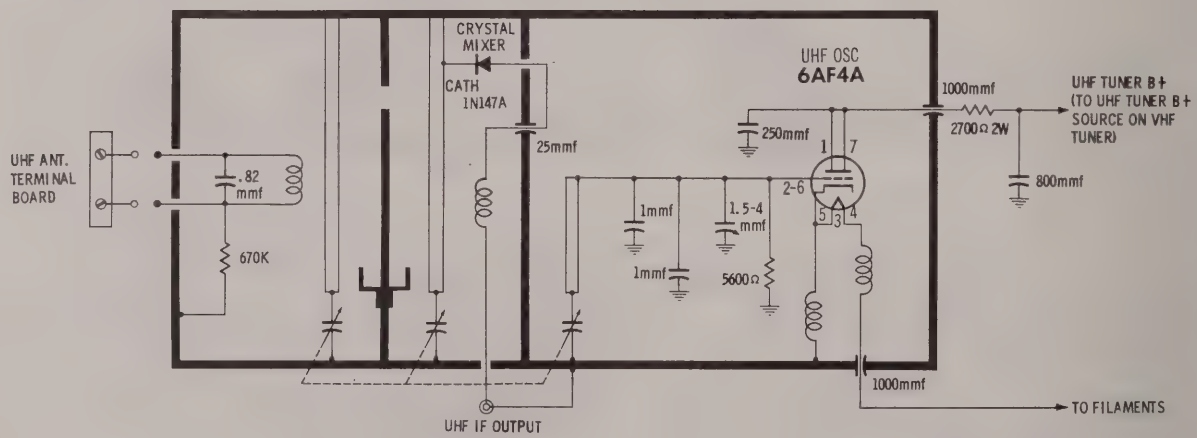


FIG. 3



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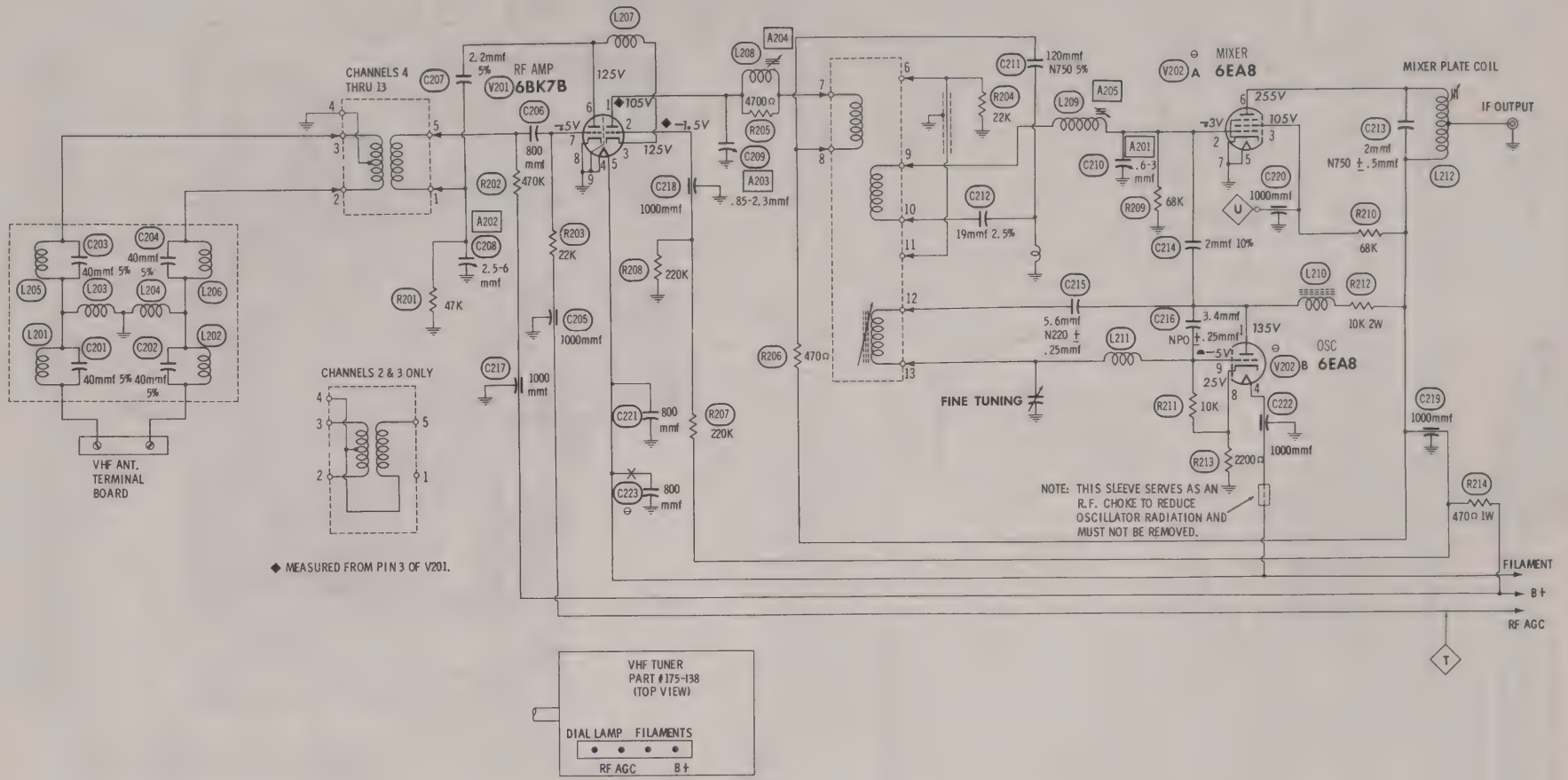
UHF TUNER 175-8



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VHF TUNER with UHF provisions 175-138

ZENITH
CHASSIS 17D20, Q, U

TUNER ALIGNMENT INSTRUCTIONS
175-137, -138

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Individual channel adjustment screws are accessible one at a time, thru a hole in the back of the tuner, as the channel selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	50-30Ω Matching Trans.	Across VHF antenna terminals thru matching transformer.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202, A203	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	"	"	A204, A205	Adjust for maximum gain and symmetry of response similar to Fig. 201. with markers as shown. Repeat steps 1 and 2 until best overall symmetry is obtained.

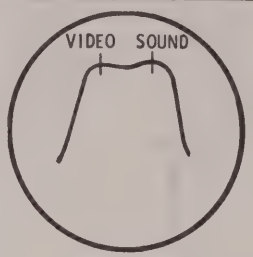
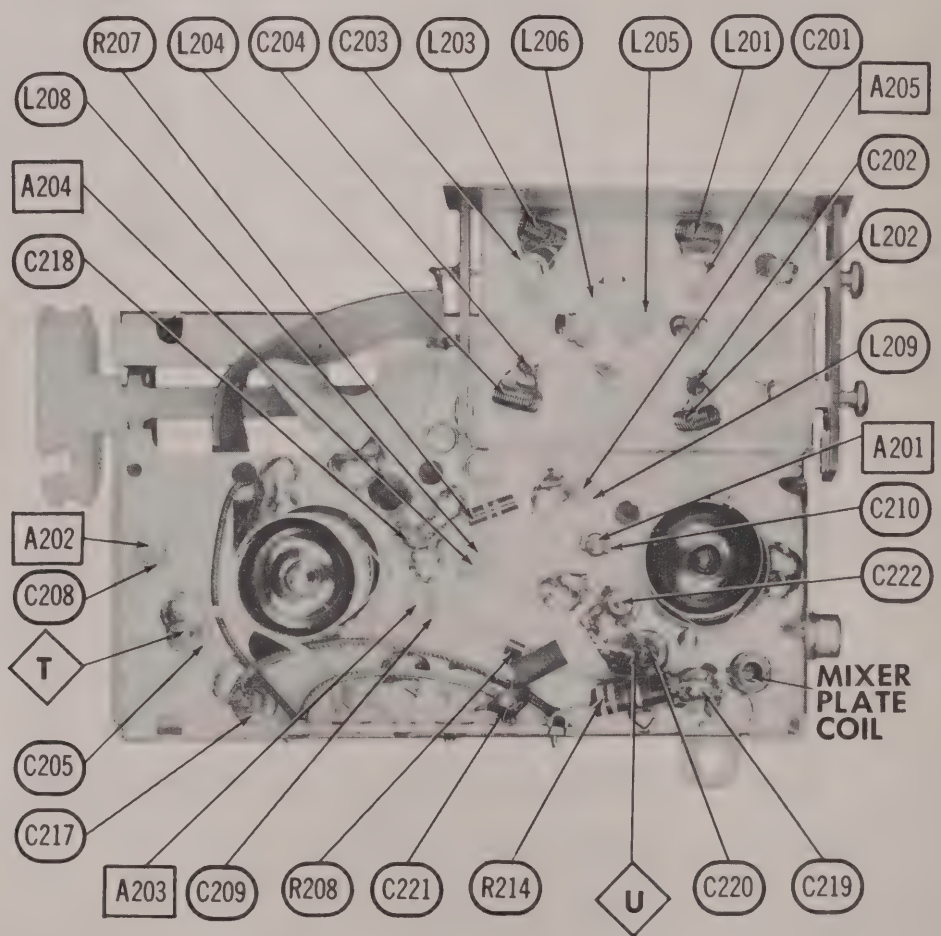
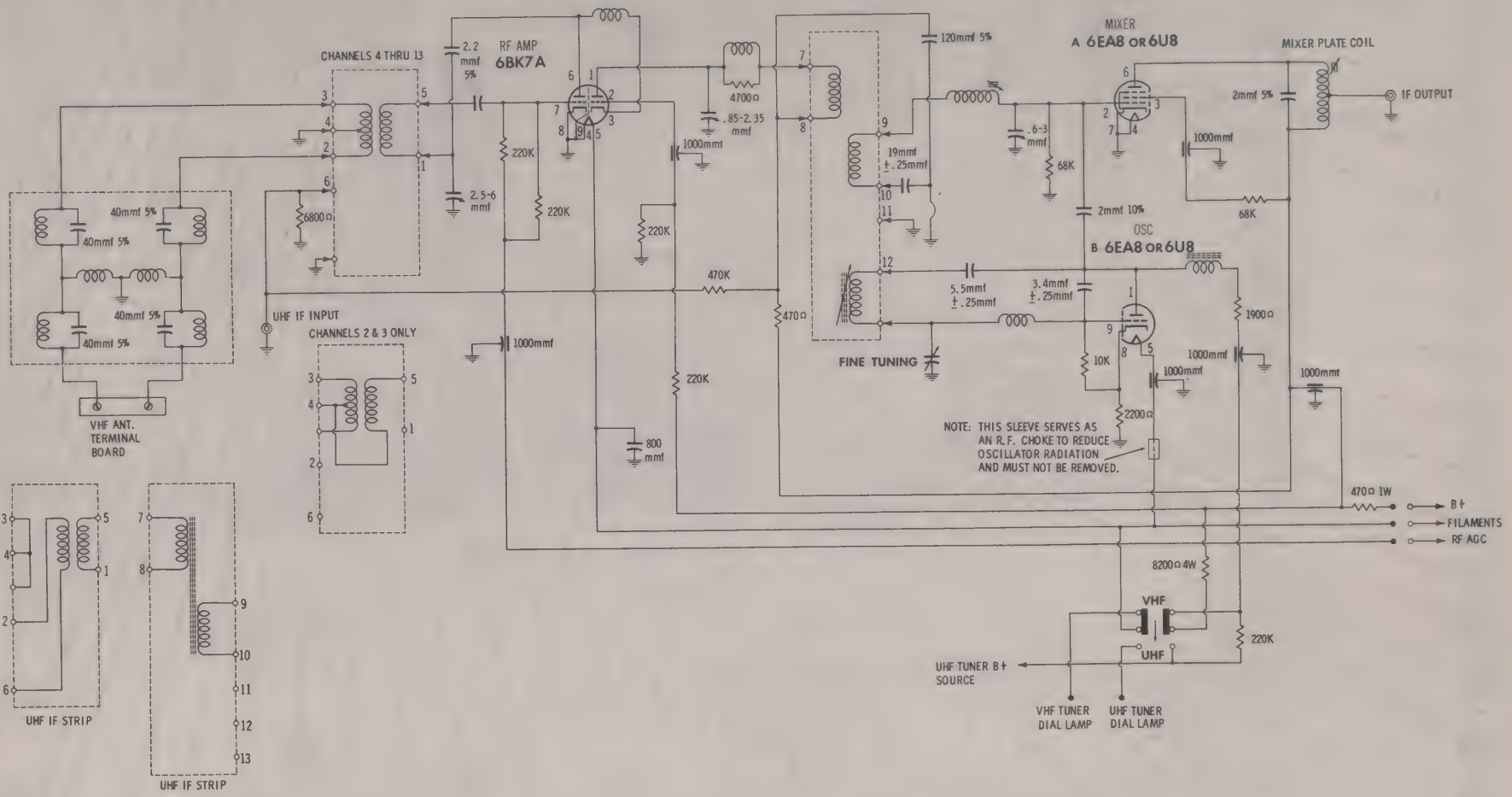


FIG. 201



TUNER 175-138 - TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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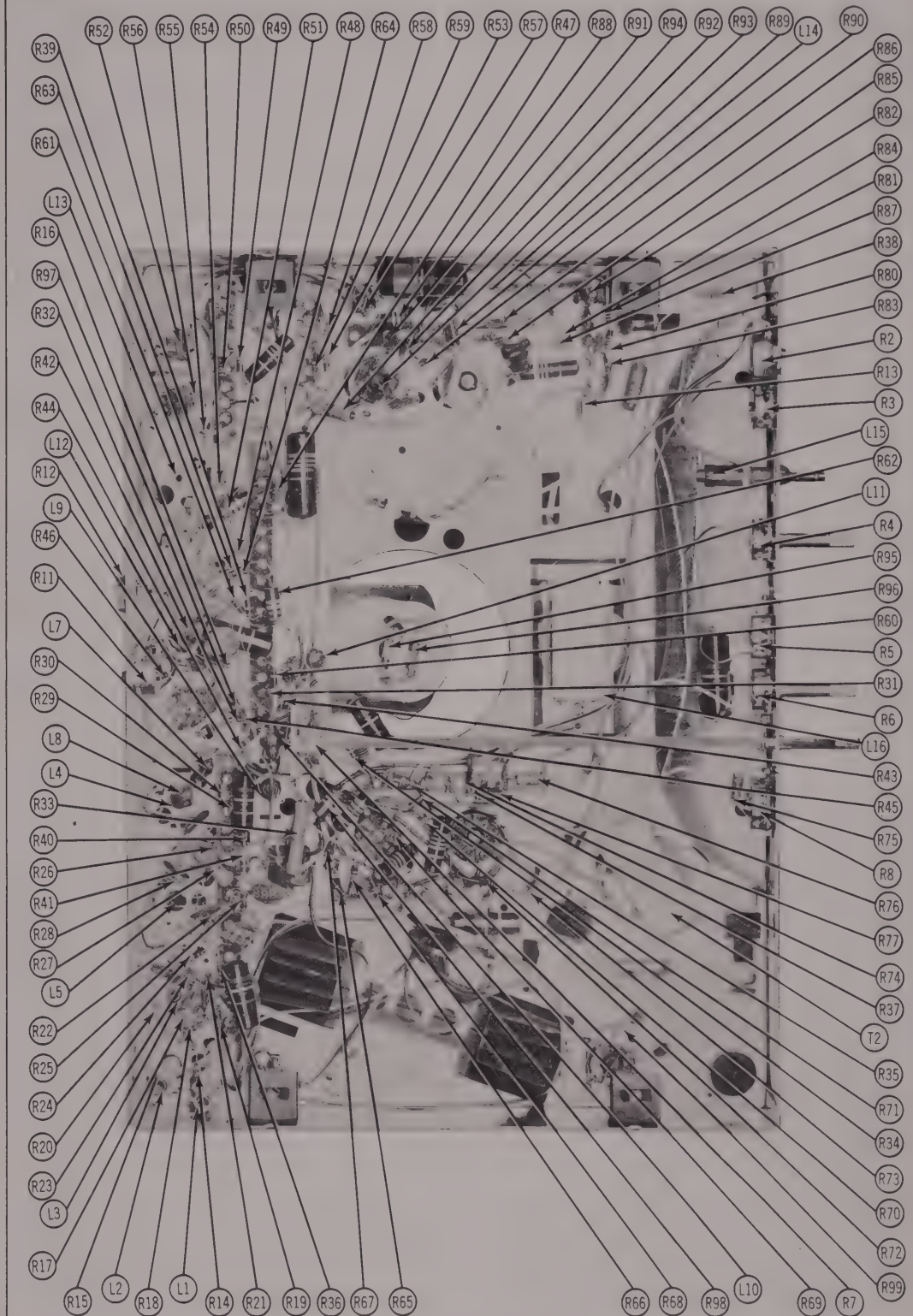
VHF TUNER with UHF provisions 175-137

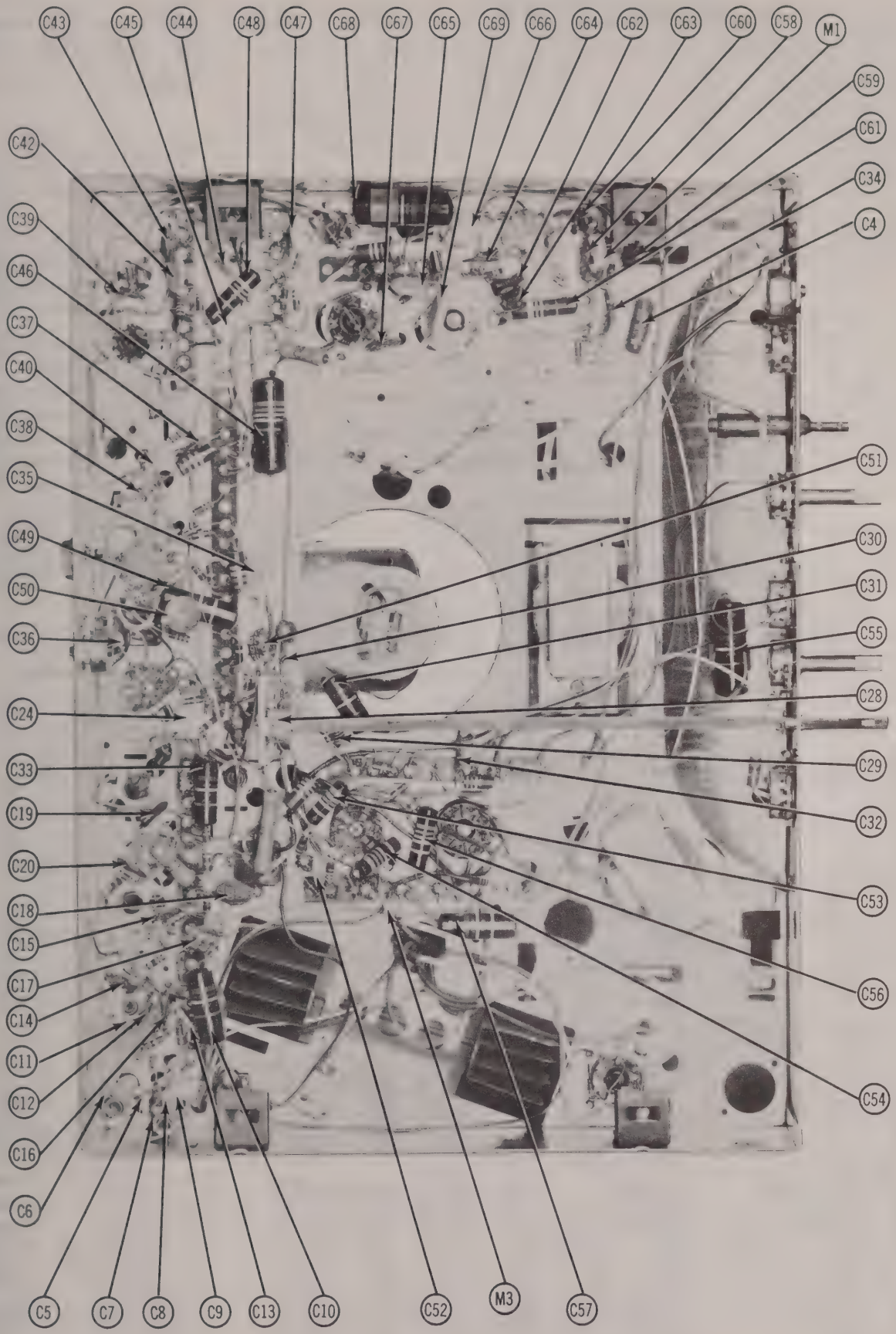
ZENITH
CHASSIS 17D20, Q, U

FOLDER 2



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ZENITH
CHASSIS 17D20, Q, U



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp.	6DR5
V4	Video-Output-Sound IF Amp	6EB8
V5	AGC Keying-Noise Limiter-Sync Sep.	6BU8
V6	Audio Detector	6BN6
V7	Audio Output	6B26
V8	Vert. Mult.	6CG7
V9	Vert. Output	6CK4
V10	Horiz. AFC-Horiz. Osc.	6CM8 (6FA8)*
V11	Horiz. Output	6DQ6B
V13	Damper	6AX4GTB (5DE4)* (5DA4)*
V12	HV Rect.	1J3
V14	LV Rect.	5V3 (5AU4) *

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: PART No. — GENERAL ELECTRIC	RCA	RAYTHEON	SYLVANIA	NOTES
V15	21CXP4	21CXP4 ①	21CXP4	21CXP4 ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	400	22-3137	AFH4-100-40	CG80	FP333.3	TMT-109	TVL-4863.4	
B	80	400							
C	100	50							
C2A	4	350	22-3118	AFH3-30-30	FB0436 FBBR4-15	FP333.1	TMD-46 TD-40-450	TVL8-3673.3*	
B	40	400							
C	4	150							
C3A	40	450	22-3162	AFH2-89-50	B0852	FP229 55	TMT-138	TVL-2708.8	
B	50	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.068 200V		P388N-068		CUB4S69	4DP-2-683	GEM-4168	4TM-S68
C5	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C6	4 NPO ± .5mmf	#22-3549			C09Y4C			10TCC-Y39
C7	1000 10%		DI-1000	DD-102	1R5DI	CCD-103	GP310	10TS-D10
C8	12 NPO 5%			TCZ-13	C10Q12C	CCTO-120	CNO-413	10TCC-Q13
C9	13 NPO 5%			TCZ-12	C10Q12C	CCTO-130	CNO-413	10TCC-Q13
C10	15 200V		P388N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C11	1		NPO-SL 1.0	TCZ-1			CNO-510	10TCC-V10
C12	5.8 NPO ± .5mmf		NPO-DI 5.8	DTZ-5R8	C10Y5BC	CCTO-5R8	CNO-568	10TCC-V58
C13	10000		BPD-01	DD-103	BYA10S	CCD-103	B-103	58K-S10
C14	1000 10%		DI-1000	DD-102	1R5DI	CCD-102	GP310	10TS-D10
C15	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C16	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C17	1000 10%		DI-1000	DD-102	1R5DI	CCD-102	GP310	10TS-D10
C18	100 10%		DI-100	DD-101	1J0QI	CCD-101	GP310	10TS-D10
C19	330 10%		BPD-331	DD-331	5R5T33	CM-303-331K	MCM341	MB-330
C20	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C21	8 .9470 ± .25mmf	#22-2990						
C22	4.7		NPO-SI 4.7	TCZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-V47
C23	4.7		NPO-SI 4.7	TCZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-V47
C24	.033 300V 10%		V94C33S3-30%		P94E3S3	4DP-3-333	GEM-4133	4TM-S33
C25	47 NO80 5%	#22-3467						
C26	3.3		NPO-SI 3.3	TCZ-3R3	C10Y3SC	CCTO-3R3	CNO-433	10TCC-V33
C27	50		NPO-SI 50	TCZ-50		CCD-500	GP450	10TS-Q50
C28	27 10%		DI-27	DD-270	1J0Q27	CCD-270	GP427	10TS-Q27
C29	50		DI-50	DD-500	1J0Q50	CCD-500	GP450	10TS-Q50
C30	10 10%		DI-10	DD-100	1J0QI	CCD-101	GP410	10TS-Q10
C31	.1 300V		P388N-1	DF-104	CUB2P1	2DP-3-104	GEM-301	2TM-P1
C32	1000 10%		DI-1000	DD-102	1R5DI	CCD-102	GP310	10TS-D10
C33	1 200V		P388N-1	DF-104	CUB2P1	2DP-3-104	GEM-301	2TM-P1
C34	1000 10%		DI-1000	DD-102	1R5DI	CCD-102	GP310	10TS-D10
C35	10000		BPD-01	DD-103	BYA10S	CCD-103	B-103	58K-S10
C36	4.3 10%		NPO-SI 4.7	TCZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-Q47
C37A	1000 10%	#22-21	DI-1000	DD-102	1R5DI	CCD-102	GP310	10TS-D10
B	1000 10%		DI-1000	DD-102	1R5DI	CCD-102	GP310	10TS-D10
C38	7.5 10%				L20Y8		GP580	10TS-V75
C39	100		BPD-0001	DD-101	L20T1	CCD-101	GP310	10TS-T10
C40	30 N75 10%	#22-3139						
C41	4700 10%		DI-4700		P94E5D47	CCD-472	JL-347	10TS-D47
C42	10000		BPD-01	DD-103	BYA10S	CCD-103	B-103	58K-S10
C43	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C44	100 N750 10%		N750-DI 100	DTN-100	C07IU	CCTN-101	CNT-310	10TCU-T10
C45	0068 200V 10%		V94C6D68-10%		P94E6S3	4DP-3-683	GEM-16368	6TM-S68
C46	22 200V 10%		V94C2P22-10%		P94P22	4DP-3-224	GEM-2022	2TM-P22
C47	10000		BPD-01	DD-103	BYA10S	CCD-103	B-103	58K-S10
C48	.047 300V		P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C49	.1 600V		P388N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C50	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-333	58K-D33
C51	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C52A	4700		BPD-2X0047	DD8-502	BYD6DD6	CCD-472	B2X250	5HK-ED47
B	4700					CCD-472		
C53	.0068 400V 10%		V94C6D68-10%		P94D6S3	6DP-3-682	GEM-16268	6TM-D68
C54	.0068 400V 10%		V94C6D68-10%		P94D6S3	6DP-3-682	GEM-16268	6TM-D68
C55	.1 600V		P388N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C56	.033 400V 10%		V94C4S33-10%		CUB4S33	4DP-2-333	GEM-1613	4TM-S33
C57	.1 600V		P388N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C58A	51	#22-25	DI-50	DD-510	1J0Q51	CCD-500	GP450	5GA-Q50
B	50		DI-50	DD-500	1J0Q51	CCD-500	GP450	5GA-Q50
C59A	1000 10%	#22-21	DI-1000	DD-102	P94E1D	CCD-102	GP310	10TS-D10
B	1000 10%		DI-1000	DD-102	P94E1D	CCD-103	GP310	10TS-D10
C60	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C61	.047 300V		P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C62	680 10%		1469-00068	DD-681	5R5T68	CM-20B-681K	MCJ 349	MB-368
C63	3300 10%		1464-0033		1R5D33	CM-20B-332K	MCJ453	MB-333
C64	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C65A	1500		BPD-2X0015	DC8-152	BYC8DD5	CCD-152	B2X215	5HK-ED15
B	1000					CCD-152		
C66	10000		BPD-01	DD-103	BYA10S	CCD-103	B-103	58K-S10
C67	4700 10%		DI-4700		1R5D47	CCD-472	JL-347	10TS-D47

Zenith Part Number * Not normally in distributor's stock Available thru distributor on order to manufacturer

FIXED CAPACITORS (cont)

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C68	.1 600V		P388N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C69	130 4000V M1500 10%	#22-3697	6QK8B					
C70	68 3000V 10%		6CK4					

Zenith Part Number * Not normally in distributor's stock Available thru distributor on order to manufacturer

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	63-4811				PP36T16	Volume
	1meg tap							
B	Shaft						D8-37	
C	Switch						Not Req.	Push-Pull Off-On
R2A	3meg	1	63-4026	AB-84	B47-3meg-2	B11-140	TA35L	Focus
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R3A	5meg	½	63-4013	AB-88	B47-5meg-2	B11-141	PTA56L	Fringe Lock
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R4A	2meg	½	63-4467	AB-85	A47-2meg-S	Q11-139	U56	Vert. Hold
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R5A	7.5meg	½	63-3169	AB-90	B47-7.5meg -2	B11-142	PTA75SL	Vert. Size
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R6A	250K	½	63-4457	B-51	A47-250K-2	Q13-130	U44	Brightness
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R7	50K	½	63-4489					Contrast
	10K tap							
R8A	1500Ω	½	63-3930	AB-8	B47-1500-8	B11-109	PTA152L	Vert. Lin.
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R9A	3meg	½	63-4591	AB-84	A47-3meg-S	Q11-140	U59	Bass, Note 1
B	Shaft			AK-8	R38-3/16	NQ	D8-37	
R10A	1meg	½	63-4496	AB-70	A47-1meg-Z	Q13-137	U53	Treble, Note 2
B	Shaft			AK-8	R38-3/16	NQ	D8-37	
R11A	10K	½	63-4095	AB-14	B47-10K-8	B11-116	TA14L	AGC
B	Shaft			AK-1	Not Req.	TM-4	Not Req.	
R12	750Ω 100Ω stop	2(WW)	63-3284	WH-751 *	38-800 *	112-800 *	FL-750 *	Buzz

* Use 100Ω series resistor.

Note 1: Models D2430E, EU, R and RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M,MU, R, RU use Part #63-4390.
Models D3010E, H, R use Part #63-4616.
Models D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L use Part #63-4612.

Note 2 Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU,D2460M, MU, R, RU use Part #63-4398.
Models D3010E, H, R use Part #63-4617
Models D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L use Part #63-4612.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R13	2.2meg	
R14	22K	
R15	1000Ω	
R16	680K	
R17	22K	
R18	56Ω	
R19	1500Ω	
R20	56K	
R21	56K	
R22	220Ω	
R23	220Ω	
R24	22Ω	
R25	1meg	
R26	18K	
R27	6800Ω 3W	#63-4098
R28	470Ω	
R29	3700Ω	
R30	27K	
R31	39K	
R32	15Ω	
R33	7500Ω 4W	#63-4055
R34	3800Ω	
R35	120K	
R36	330K	
R37	150K	
R38	470K 1W	
R39	100K	
R40	330K	
R41	3.3meg	
R42	680K	
R43	47K	
R44	150K	
R45	15K	
R46	100K	
R47	680K	
R48	680Ω	
R49	470Ω	
R50	390K	
R51	27K 2W	
R52	3.3meg	
R53	100K	
R54	3300Ω	
R55	10K	
R56	470Ω 1W	
R57	3300Ω	
R58	4700Ω	
R59	150K	
R60	150K	
R61	8 2meg	
R62	22K 2W	
R63	82K	
R64	150K	
R65	8200Ω	
R66	33K	
R67	6800Ω	
R68	100K	
R69	3300Ω	
R70	1.2meg	
R71	2.2meg	
R72	220Ω	
R73	1.2meg	
R74	20K 5%	
R75	5600Ω 1W	
R76	3300Ω 1W	
R77	82K 5% 1W	
R78	560Ω	
R79	560Ω	
R80	330K	
R81	330K	
R82	1meg	
R83	100K	
R84	120K	
R85	100K	
R86	100K	
R87	8.5meg	
R88	130K 3W	
R89	47K	
R90	18K	
R91	100Ω	
R92	1meg	
R93	100Ω	
R94	10K 3W	#63-4097
R95	1.8Ω	#63-3205
R96	22K 1W	
R97	330Ω	
R98	27K 2W	
R99	220K	
R100	1000Ω	

Zenith Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer	Meissner	Merit	Miller	Ram	NOTES
L1A	47.25MC Trap	S-41883						
B	39.75MC Trap							
L2A	1st Video IF	S-49891						
B	41.25MC Trap							
L3A	2nd Video IF	S-43443						
B	47.25MC Trap							
L4	3rd Video IF	S-46741						
L5	4th Video IF	S-46868						
L6	Series Peaking Coil	S-41879 †	19-3083	19-3083	TV-181	6177	VP-3	90uh
L7	Shunt Peaking Coil	S-43619	19-3180	19-3180	TV-184	6180	VP-5	170uh
L8	Resonant Choke	S-31888 †						0uh
L9A	Sound Take-Off	S-43128						
B	4.5MC Trap							
L10	Shunt Peaking Coil	S-16011	19-3250	19-3250	TV-185	6181	VP-6	250uh
L11	Series Peaking Coil	S-43616	19-3180 *	19-3180 *	TV-184 *	6180 *	VP-5 *	170uh ①
L12	2nd Sound IF	S-41899	17-1021 ▲	17-1021 ▲	TV-149 ▲			
L13	Quadrature Coil	S-47703	20-3005 ▲	20-3005 ▲	TV-121 ▲	1480 ▲		
L14	Resonant Choke	S-32777						10.6uh

* Parallel with 5600Ω resistor. ▲ Remove C40 (20mmf Cap.) ① Wound on 5600Ω resistor.
▲ Enlarge mounting hole. † Part of M6.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	Hallodorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordorson PART No.	NOTES
L15	94Ω		S-49679		HS-7	TV-155		HS-7	Horiz. Osc. Tapped @ 26Ω

FILTER CHOKE

ITEM No	RATINGS: CURRENT (Measured)	DC RES	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: ZENITH PART No.	Hallodorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No
L16	270 A	53Ω	1.6HY	95-1559		28C44	C-3996	C-3336	28C44	C-28X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: ZENITH PART No.	Hallodorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No
T1	117V@ 1.95A	580 VCT @ 285A	5V@ 3 8A	95-1561						R-80BC
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 9A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Hallodorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T2	Vert. Output	95-1656	26575 ①	A-2821	VO15 ②	A-8149	26575 ①		A-13X
T3	Yoke-Horiz. (13.8MH)	95-1654	Y-39 ③	MDF-91	Y90F12/47	PCM1045	A-8149	DY-13A	Y-40 & MW-3 ⑤
	Rear Cover & Centering Device	S-23237							YC-1
T4	Horiz. Output	S-47071							
	Horiz. Output	S-46592 ⑦							

① Use 6 to 1 turns ratio. Connect as autoformer.
② Cut and tape green lead.
③ Connect yoke terminal #2 to terminal #4 of Horizontal Output Transformer, yoke terminal #7 to terminal #2 of Horizontal Output Transformer, connect 1000Ω ½ watt resistor from yoke terminals #1 and #3 to terminal #3 of Horizontal Output Transformer.
④ Use original rear cover and yoke damping capacitor.
⑤ Connect yoke terminal #3 to terminal #4 of Horizontal Output Transformer, yoke terminal #1 to terminal #8 of Horizontal Output Transformer, connect 1000Ω ½ watt resistor from yoke terminals #2 and #7 to terminal #3 of Horizontal Output Transformer.
⑥ Cut and form a piece of .010 gauge fish paper inside the yoke itself and support with an acetate cement, to provide an insulation between width sleeve and the yoke proper.
⑦ Used with alternate Horizontal Sweep Circuit

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	Hallodorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T5	7500Ω	3-4Ω	95-1613	26848 ①	A-3020 ①	AU-604 ①	A-3849 ①	26848 ①	S-8X	① Drill New Mounting Hole

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	QUAM PART No.	NOTES
SP1	6"x 9"	PM	8-3Ω	49-831 ①	69A12S.8	1 Models D2460M, ML, R, RU, D2464L, LU, W, WU, D3014E, W, Y, D3014W
SP2	5"x 7"	PM	6-8Ω	49-833 ①	57A12S.5	2 Models D2464L, LU, W, WU, D2462H, HU
SP3	Electrostatic			5-23829 ②		3 Used in all Models except D2430E, H, W
SP4	Electrostatic			5-23829 ③		4 Models D2430S, R, W (2 used)
	10"	PM	3-4Ω	49-822 ④	10A6A	5 Models D2462H, HU (2 used)
	8"	PM	6-8Ω	49-827 ④	8A12S.4	6 Models D3010E, H, R
				49-835 ⑤		7 Models D3012H, R, D3013H, D3015L (2 used)
				49-830 ⑦		

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ZENITH PART No.	INTERNATIONAL PART No.	ITT PART No	SARKES TARZIAN PART No.	SYLVANIA PART No	NOTES
M1		103-20 ①	SD-91 ②	KJ615 ③			① Selenium Dual Diode ② Silicon Type, 2Used

FUSES

ITEM No	TYPE	RATING	REPLACEMENT DATA: ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	N	2/10A 250V 3/8	136-38	53-21	333.750 (M 7/10A 250V 3/8)	346000	N 7/10	HN 1/2 to 3/4
M3		1 1/4" length of #24 wire						

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ZENITH PART No.	CBS PART No	RAYTHEON PART No.	SYLVANIA PART No	NOTES
M4		103-33	1N60	1N295	1N295	Video Detector (Pigtail)

ZENITH CHASSIS 17D20, Q, U

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M5	Tuner	175-138	VHF, Models D2430E, R, W, D2458E, R, W, D2460M, R, D2462H, D2464L, W, D3010E, H, R, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
	Tuner	175-137	VHF with UHF Provisions, Models D2430EU, RU, WU, D2458EU, RU, WU, D2460MU, RU, D2462HU, D2464LU, WU
	Tuner	175-8	UHF, Models D2430EU, RU, WU, D2458EU, RU, WU, D2460MU, RU, D2462HU, D2464LU, WU
M6	4th IF Trans.	S-46869	Assembly, Includes M4, C21, C22, C23, L5, L6
	Magnet	S-46005	Correction (2 used)

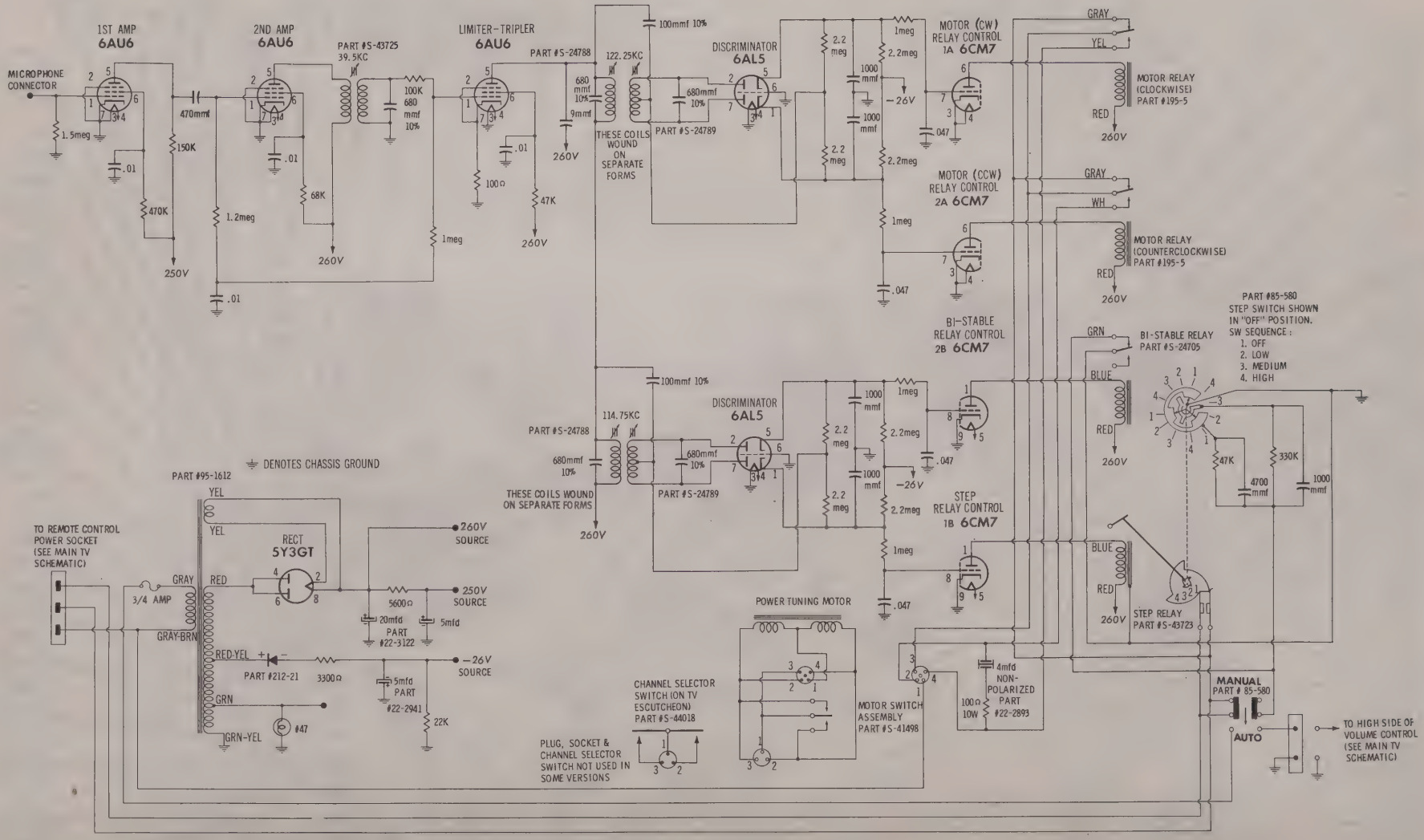
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	192-285	Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU
Safety Glass	192-279	Models D2462H, HU, D2464L, LU, D2464W, WU, D3010E, EU, D3010H, HU, R, RU
Safety Glass	192-263	Models D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	46-2171	Channel Selector, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D2462H, HU, D2464L, LU, W, WU
Knob	S-47420	Channel Selector, Models D3010E, H, R, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	S-45733	UHF Dial, Models D2430EU, RU, WU, D2458WU, EU, RU, D2460MU, RU, D2462HU, D2464LU, D2464WU
Knob	S-46280	Fine Tuning, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D2462H, HU, D2464L, LU, W, WU
Knob	46-2035	Fine Tuning, Models D3010E, H, R, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	S-45716	Volume, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D2462HU, D2464LU, D2464WU, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	S-46726	Volume, Models D2462H, D2464L, W, D3010E, H, R
Knob	S-43672	Brightness, Vertical, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	S-46725	Brightness, Vertical Hold, Models D2462H, HU, D2464L, LU, W, WU, D3010E, H, R
Knob	S-41482	Contrast, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	S-46724	Contrast, Models D2462H, HU, D2464L, LU, W, WU, D3010E, H, R
Knob	76-1025	Horizontal Hold, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	46-1118	Horizontal Hold, Models D2462H, HU, D2464L, LU, W, WU, D3010E, H, R
Knob	S-46154	Tone, Models D2430E, EU, R, RU, W, WU, D2458E, EU, R, RU, W, WU, D2460M, MU, R, RU, D3011E, W, Y, D3012H, R, D3013H, D3014W, D3015L
Knob	S-46726	Tone, Models D2462H, HU, D2464L, LU, W, WU
Knob	S-46716	Tone, Models D3010E, H, R
Cabinet	14-2724	Models D2430E, U
Cabinet	14-2723	Models D2430R, U
Cabinet	14-2725	Models D2430W, U
Cabinet	14-2760E	Models D2458E, U
Cabinet	14-2760R	Models D2458R, U
Cabinet	14-2760W	Models D2458W, U
Cabinet	14-2781M	Models D2460M, U
Cabinet	14-2781R	Models D2460R, U
Cabinet	14-2758H	Models D2462H, U
Cabinet	14-2759L	Models D2464L, U
Cabinet	14-2759W	Models D2464W, U
Cabinet	14-2800E	Model D3010E
Cabinet	14-2800H	Model D3010H
Cabinet	14-2800R	Model D3010R
Cabinet	14-2798E	Model D3011E
Cabinet	14-2798W	Model D3011W
Cabinet	14-2798Y	Model D3011Y
Cabinet	14-2803H	Model D3012H
Cabinet	14-2803R	Model D3012R
Cabinet	14-2835H	Model D3013H
Cabinet	14-2805W	Model D3014W
Cabinet	14-2806L	Model D3015L

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



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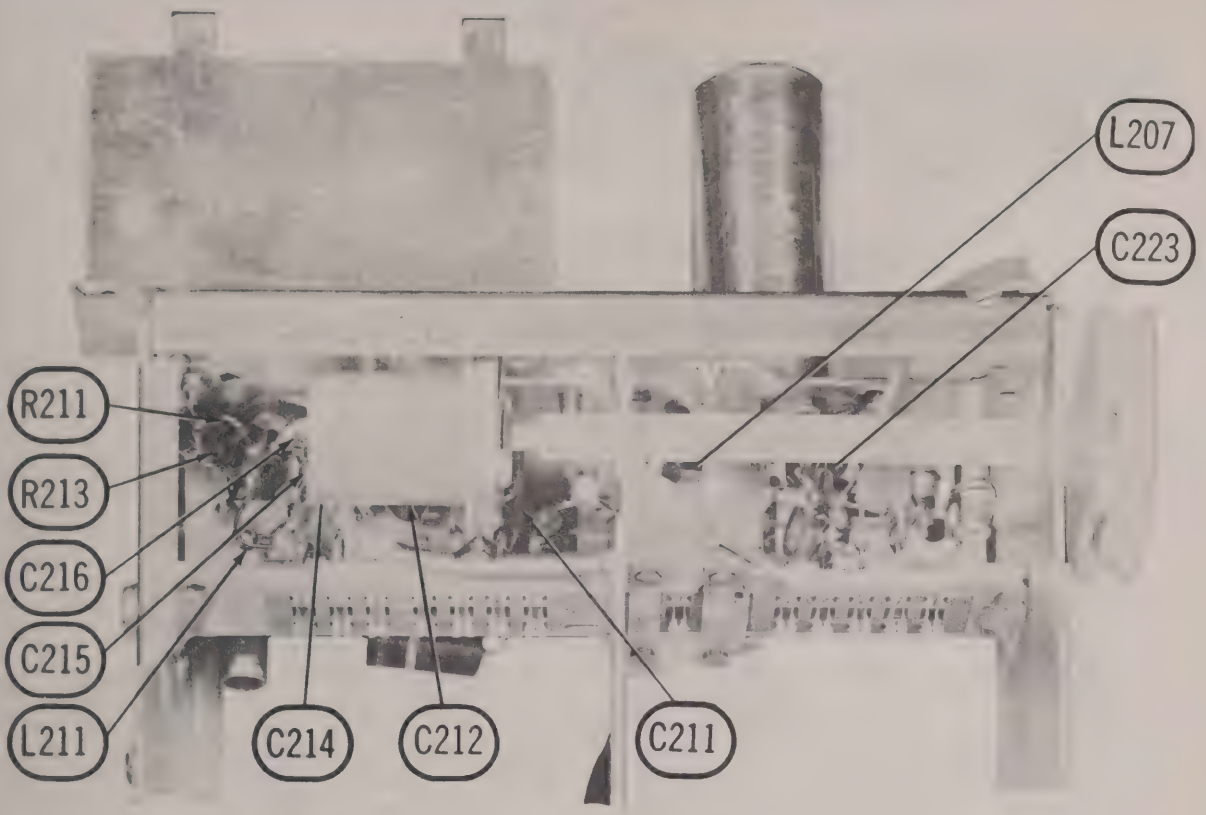
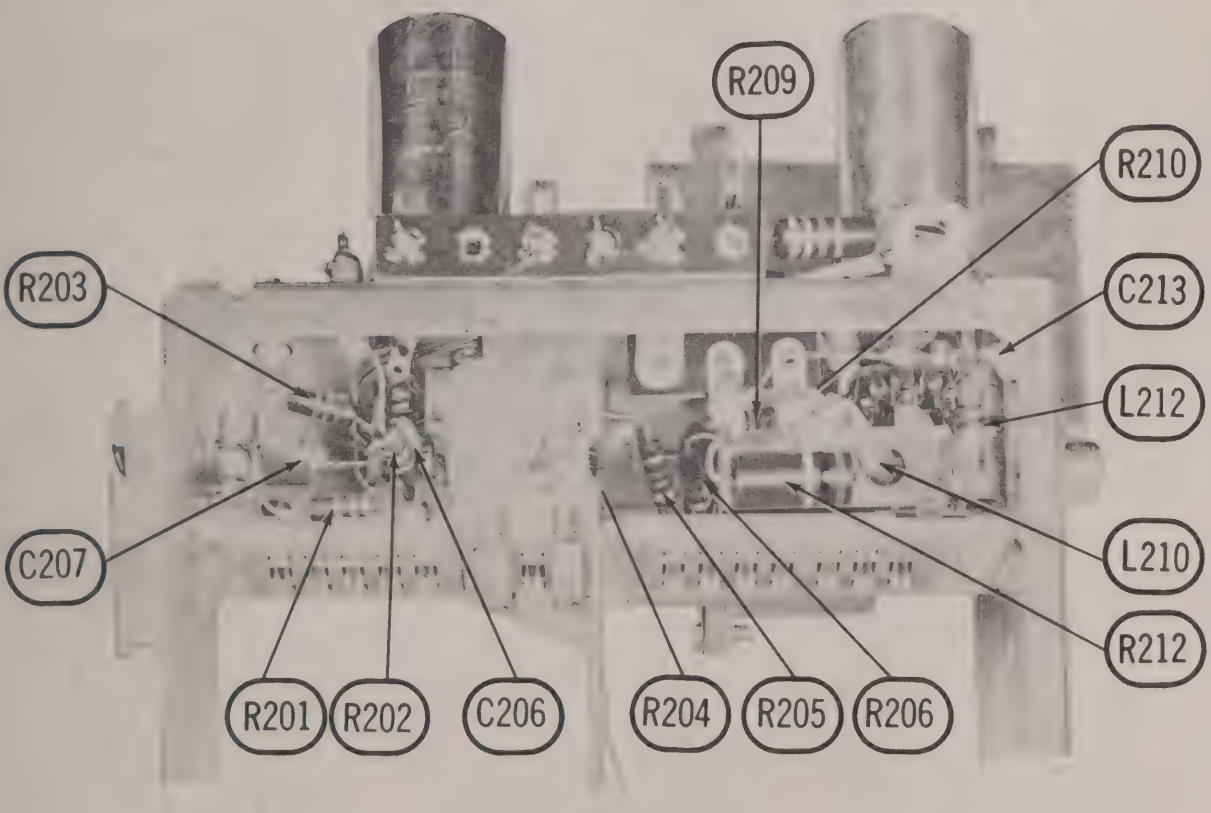
REMOTE CONTROL S-46834, S-46844



TUNER 175-138 - LEFT SIDE



TUNER 175-138 - RIGHT SIDE

TUNER PARTS LIST AND DESCRIPTIONS

175-138

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	6BK7B
V202	Mixer-Osc.	6EA8 (6U8) *

* Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C202	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C203	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C204	40 5%			TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	800		BPD-0008	DD-801	L10T8	CCD-821	B-382	5GA-T80
C207	2.2 5%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C208	2.5-6	#22-2221		829-6		CV-3	CT552	
C209	.85-2.3	#22-2453		829-3		CV-1	CT565	
C210	.6-3.0	#22-2504		829-3		CV-1	CT565	
C211	120 N750 5%			TCN-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C212	19 2.5%		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-418	10TCC-Q20
C213	2 N750 ±.5mmf						CN7-522	10TCU-V22
C214	2 10% ±		NPO-SI 2.0	TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C215	5.6 N220 ±.25mmf	#22-2499				*		10TCR-V56
C216	3.4 NPO ±.25mmf		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	
C221	800		BPD-0008	DD-801	L10T8	CCD-821	B-382	5GA-T80
C222	1000		EF-001	MFT-1000		CCF-102	CT280A	
C223	800	Note 1	BPD-0008	DD-801	L10T8	CCD-821	B-382	5GA-T80

\# Zenith Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.

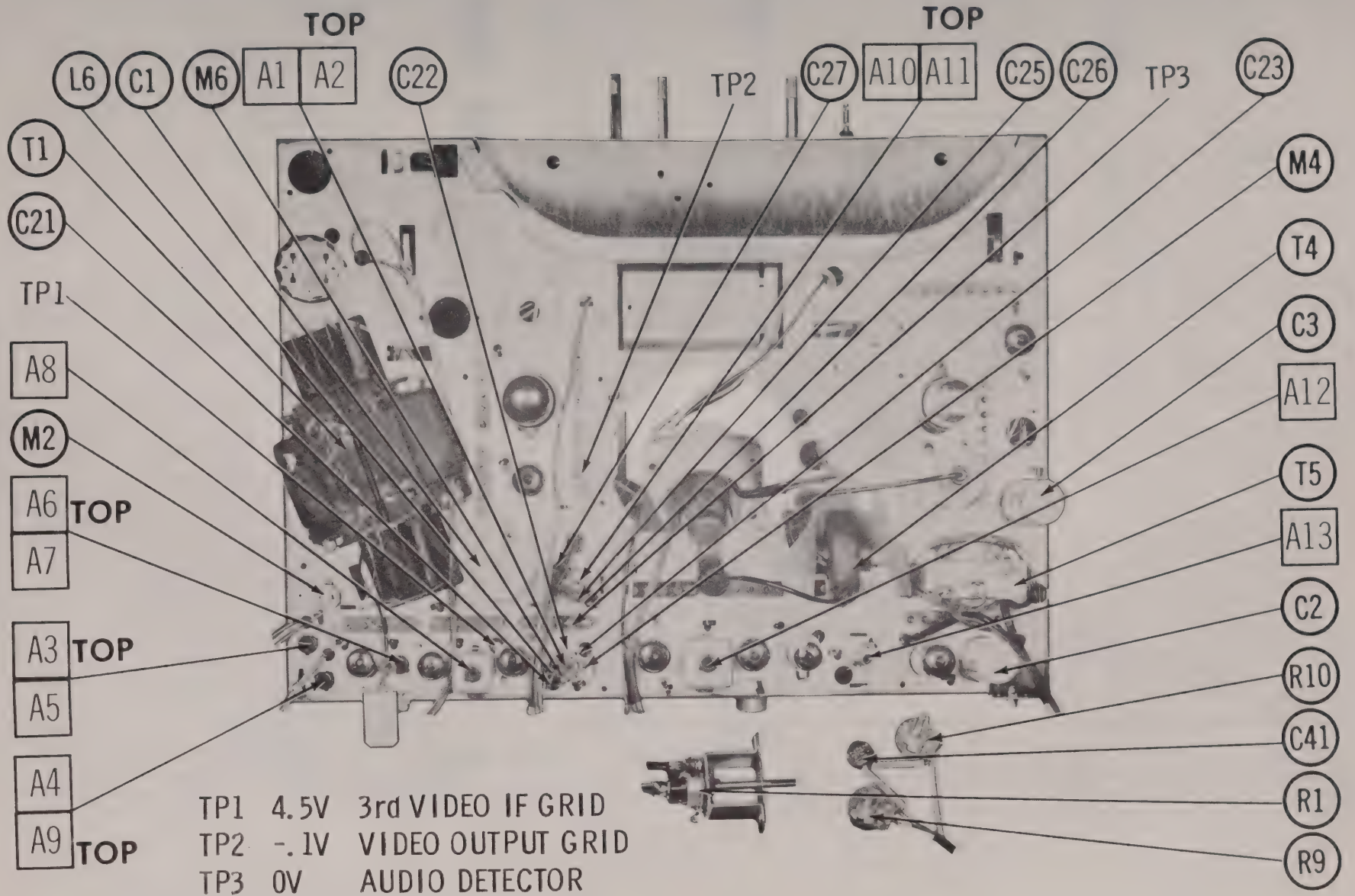
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	470K	
R203	22K	
R204	22K	
R205	4700Ω	
R206	470Ω	
R207	220K	
R208	220K	
R209	68K	
R210	68K	
R211	10K	
R212	10K 2W	
R213	2200Ω	
R214	470Ω 1W	

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Coil	20-490	
L202	Ant. Coil	20-490	
L203	Ant. Coil	20-505	
L204	Ant. Coil	20-505	
L205	Ant. Coil	20-490	
L206	Ant. Coil	20-490	
L207	RF Choke	20-431	
L208	RF Plate Coil	20-537	
L209	Mixer Grid Coil	20-538	
L210	RF Choke	S-18859	
L211	RF Choke	20-541	
L212	Mixer Plate Coil	S-45230	



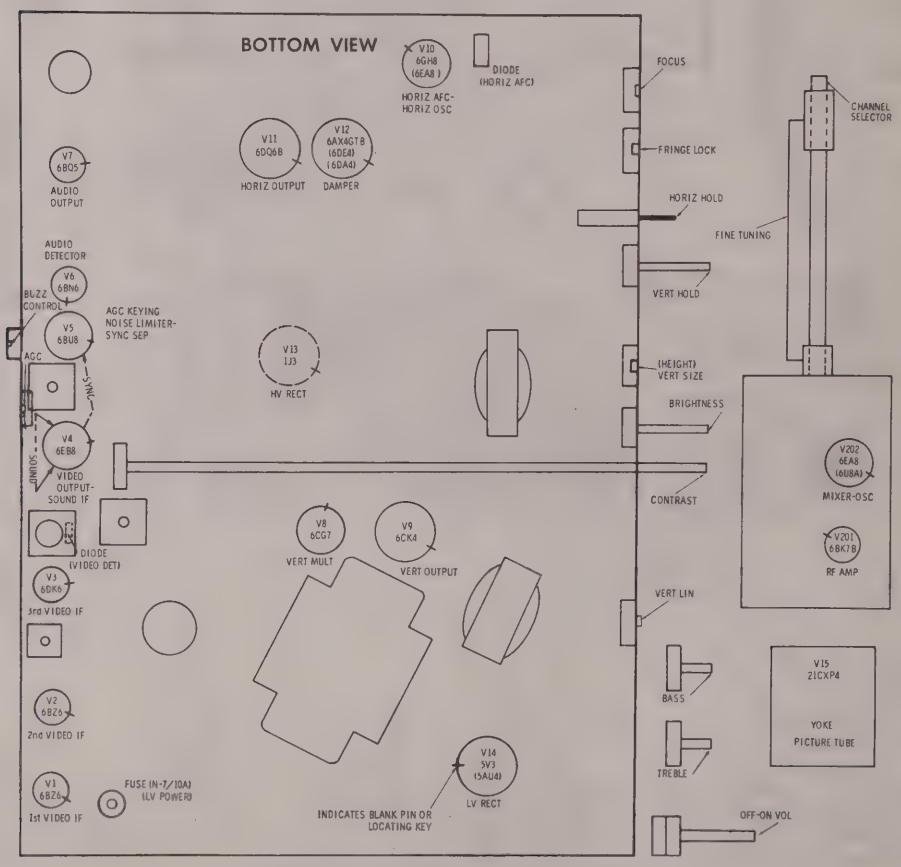
CHASSIS - TOP VIEW

RESISTANCE MEASUREMENTS

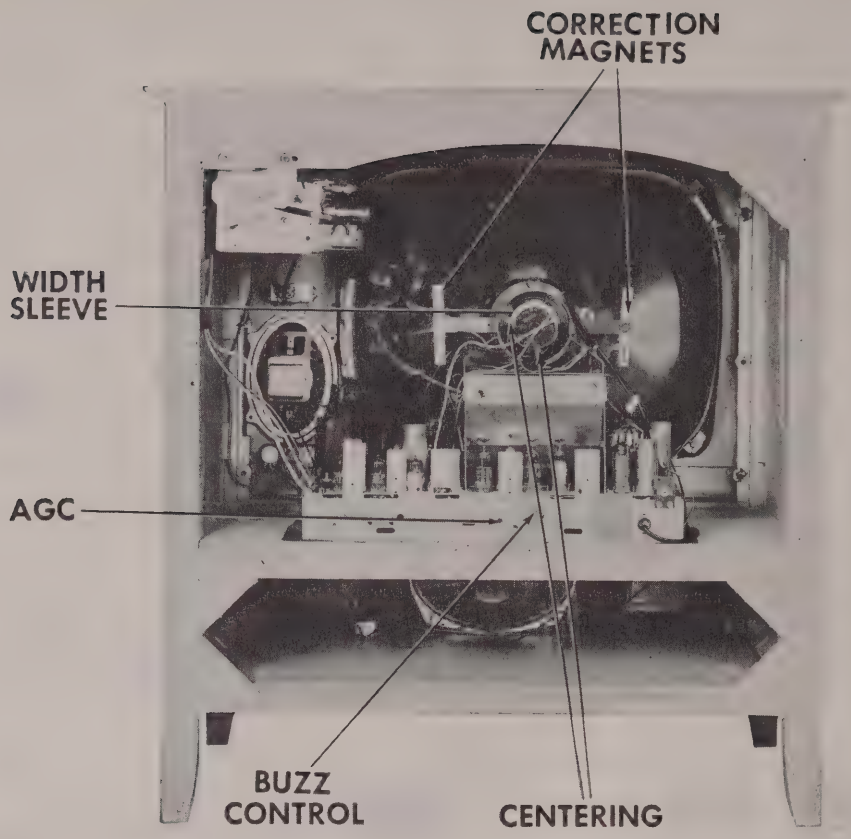
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	● 1.3meg	1550Ω	.1Ω	0Ω	▲ 240Ω	▲ 240Ω	1500Ω		
V2	6BZ6	30K	▲ 22Ω	.1Ω	0Ω	† 220Ω	† 220Ω	INF		
V3	6DK6	18K	470Ω	.1Ω	0Ω	† 8200Ω	† 8200Ω	0Ω		
V4	6EB8	0Ω	100K	† 150K	.1Ω	0Ω	15Ω	2700Ω	† 27K	† 5000Ω
V5	6BU8	● 6000Ω	† 22K	● 800K	.1Ω	0Ω	† 110K	●† 350K	† 60K	† 8.2meg
V6	6BN6	● 250Ω	.5Ω	.1Ω	0Ω	† 27K	3.7Ω	† 390K		
V7	6BQ5	13K	13K	220Ω	.1Ω	0Ω	NC	† 1100Ω	NC	† 470Ω
V8	6CG7	● ǂ 3.8meg	● 1.8meg	0Ω	0Ω	.1Ω	† 100K	5500Ω	3300Ω	NC
V9	6CK4	NC	.1Ω	1.2meg	NC	† 675Ω	NC	0Ω	● 850Ω	
V10	6GH8	† 100K	100K	† 47K	0Ω	.1Ω	ǂ 120K	26Ω	0Ω	1.3meg
V11	6DQ6B	TP	.1Ω	NC	† 10K	1meg	NC	0Ω	0Ω	TOP CAP ǂ 9Ω
V12	6AX4GTB	NC	NC	¶ 4meg	NC	†.4Ω	NC	0Ω	.1Ω	
V13	1J3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ 285Ω
V14	5V3	NC	¶	TP	20Ω	NC	22Ω	TP	¶	
V15	21CXP4	.1Ω	0Ω	Pin 6 ●ǂ 1.5meg	Pin 10 † 190K	Pin 11 ● 150K	Pin 12 0Ω			
V201	6BK7B	† 940Ω	120K	INF	0Ω	.1Ω	INF	2.9meg	0Ω	0Ω
V202	6EA8	† 10K	68K	† 68K	.1Ω	0Ω	† 470Ω	0Ω	2200Ω	12K
ITEM	TYPE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 260V SOURCE.
ǂ MEASURED FROM PIN 3 OF V12.

NC NO CONNECTION.
TP TIE POINT.



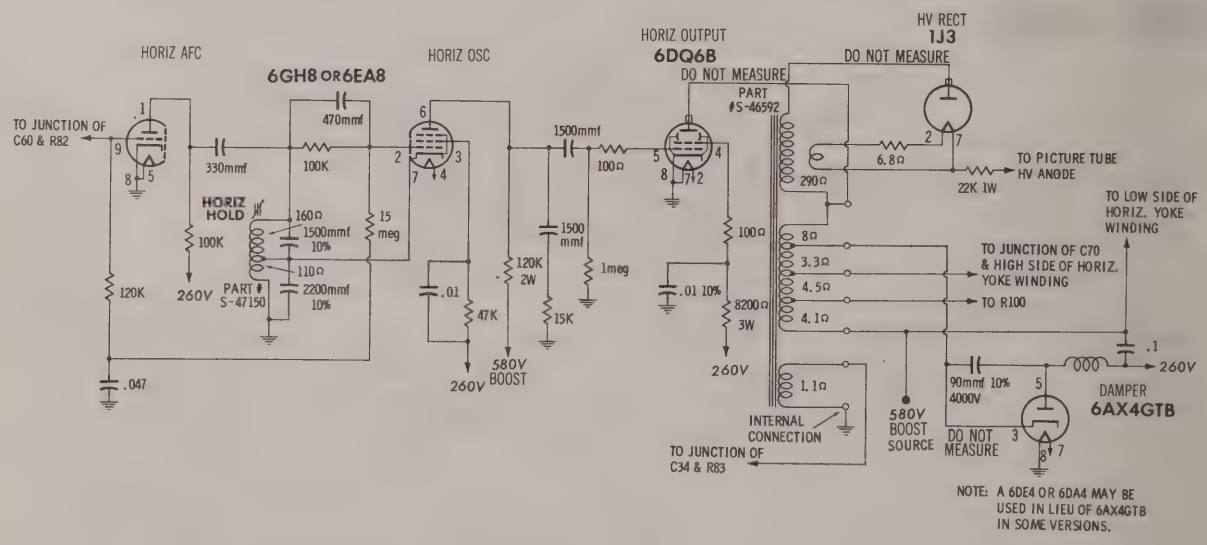
TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold is equipped with a stop which limits rotation to approximately 270 degrees with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to that point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.



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ALTERNATE HORIZONTAL SWEEP CIRCUIT

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ARVIN
MODEL 7595 (Ch. 1.47200)

ARVIN
MODEL 7595 (Ch. 1.47200)

ARVIN
MODEL 7595 (Ch. 1.47200)

TRADE NAME	Arvin Model 7595 (Ch. 1.47200)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC
RATING	20MA @ 6 Volts DC
TUNING RANGE—BROADCAST	540 - 1670KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3 .....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A4, A6 .....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5 .....GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

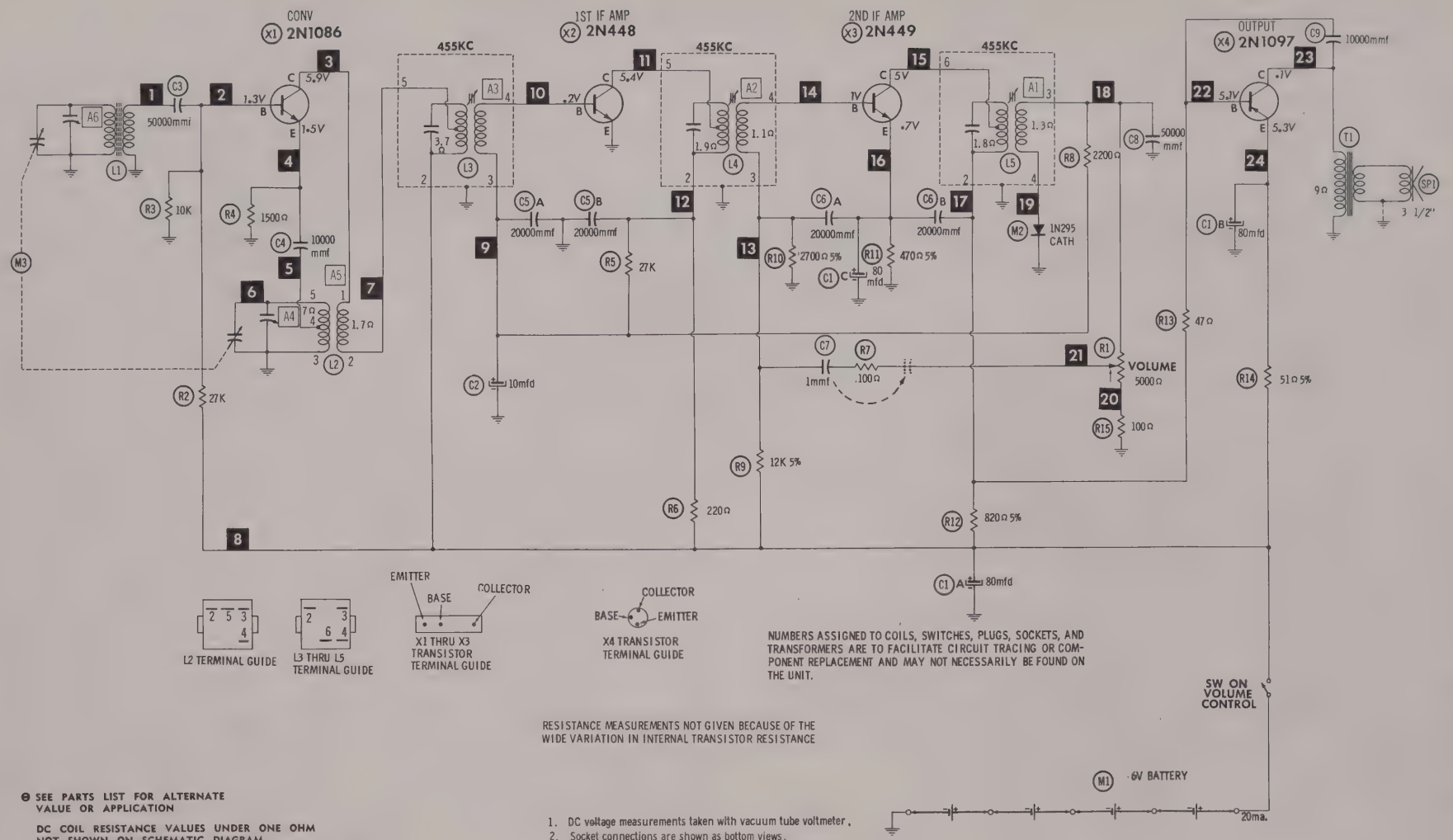
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to antenna lug of tuning gang Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A5	"
4.		"	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JF446

SET 469 FOLDER 3



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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ARVIN
MODEL 7595 (Ch. 1.47200)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1086	Converter					NPN
X2	2N448	1st IF Amplifier					NPN
X3	2N449 *	2nd IF Amplifier				2N167	NPN
X4	2N1097 †	Output				2N323	PNP

* Alternate Type 2N169. † Alternate Type 2N323.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	80	12	46823-1						
B	80	12							
C	80	12							
C2	10	10	44396-4	PWE100-10	EC10-10	TT12X10	ML10-15	TE-1114	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	50000		BPD-05	DD-503	H-05S5	1DP-2-503	TA-150	5HK-S50
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	B-120	5HK-2S20
B	20000			DD-203	BYB6S2	CCD-203	B-120	
C6A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	B-120	5HK-2S20
B	20000			DD-203	BYB6S2	CCD-203	B-120	
C7	1.0mfd			UK-105	MP2W1			HY135
C8	50000		BPD-05	DD-503	H-05S5	1DP-2-503	TA-150	5HK-S50
C9	10000		BPD-01	DD-103	BYA10S1	CCD-503	B-110	5HK-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	.2	46800-2					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	27K	
R3	10K	
R4	1500Ω	
R5	27K	
R6	220Ω	

ITEM No.	RATING	REMARKS
R7	100Ω	
R8	2200Ω	
R9	12K 5%	
R10	2700Ω 5%	
R11	470Ω 5%	

ITEM No.	RATING	REMARKS
R12	820Ω 5%	
R13	47Ω	
R14	51Ω 5%	
R15	100Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ARVIN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	45534-14						
L2	Osc. Coil	45783-10						
L3	1st IF Trans.	45900-8						
L4	2nd IF Trans.	45900-9						
L5	3rd IF Trans.	45900-10						

PRINTED BOARD

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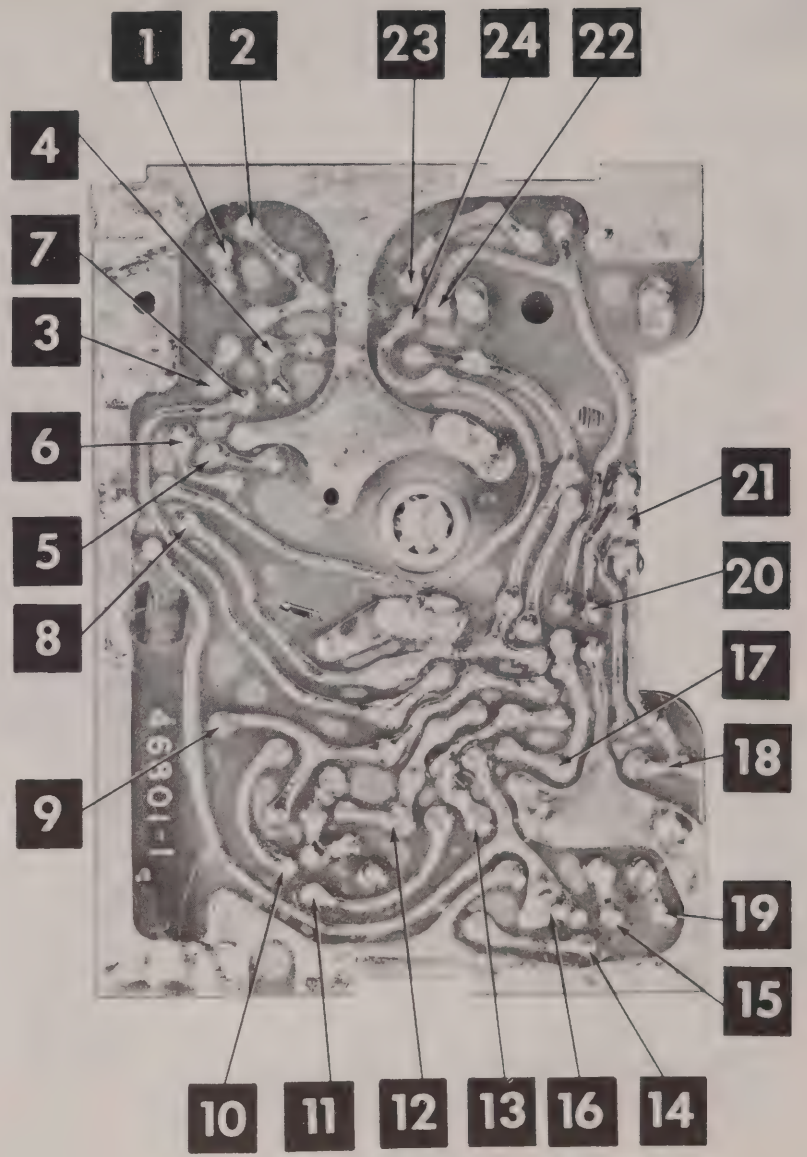


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	200Ω	12Ω	45838-2						TY-57X ①	① Bend ears down

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	3½"	PM	12-14Ω	46523-3		

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			230 ①		A100 ①		M-13R①	① Four required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ARVIN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295	43959	1N60	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	Tuning Cap.	47425	2 Gang: (Ant. 20-132mmf, Osc. 15-95mmf)

CABINETS & CABINET PARTS

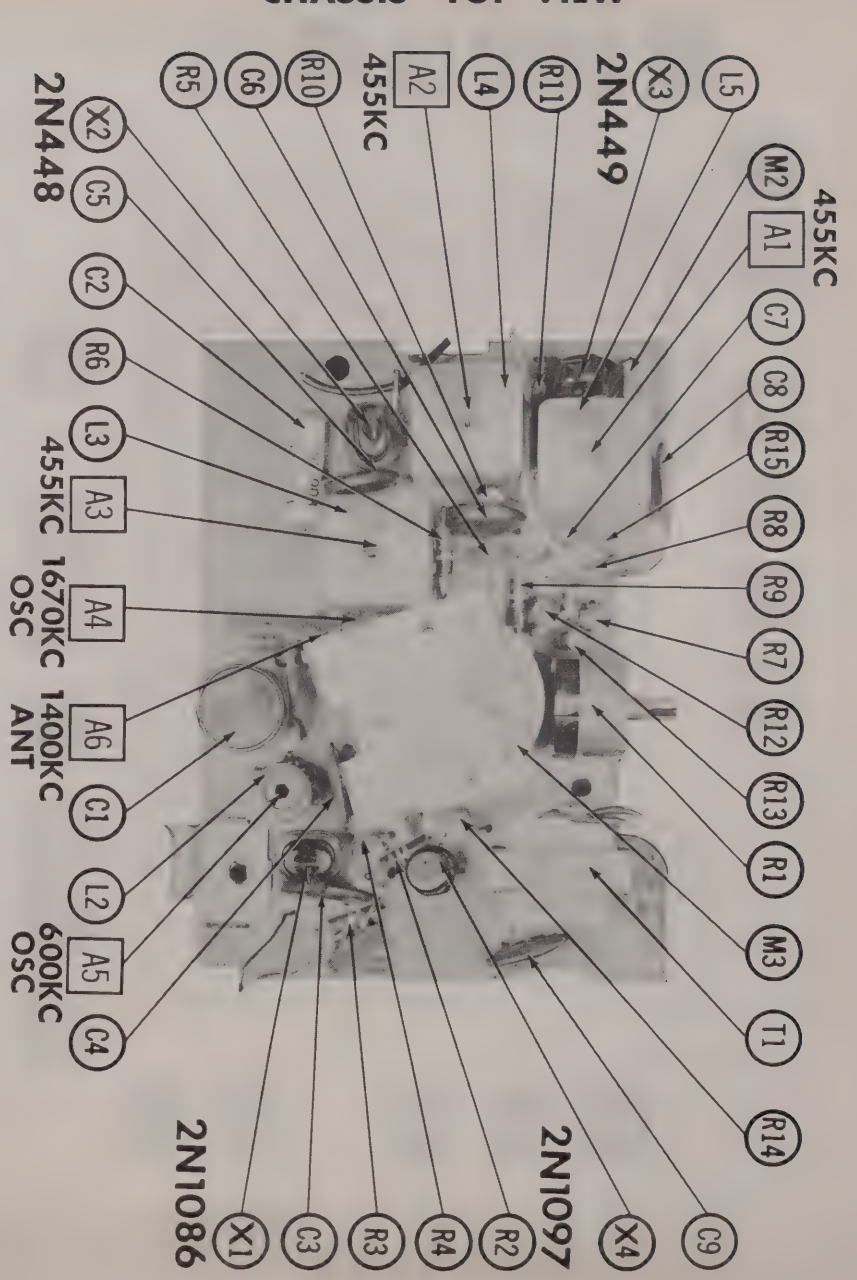
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	46811-19	Tuning, Charcoal
Knob	46811-53	Tuning, Pink
Knob	46810-67	Off-On, Volume
Cabinet Front	46789-67	Off White
Cabinet Back	46611-19	Charcoal
Cabinet Back	46611-53	Pink
Handle	46692-2	Brass

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER

CONTINENTAL MODEL TR-100

CONTINENTAL MODEL TR-100

CONTINENTAL MODEL TR-100

TRADE NAME	Continental Model TR-100
IMPORTER	Continental Merchandise Co., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 - 1605KC
RATING	10.5MA @ 9 Volts DC (No Signal, Min. Volume) 11MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2 ..... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537
A3, A4 .....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1605KC	"	"	A3	"
3.		"	1400KC	Tune to 1400KC signal	"	A4	Adjust for maximum output while rocking tuning gang.

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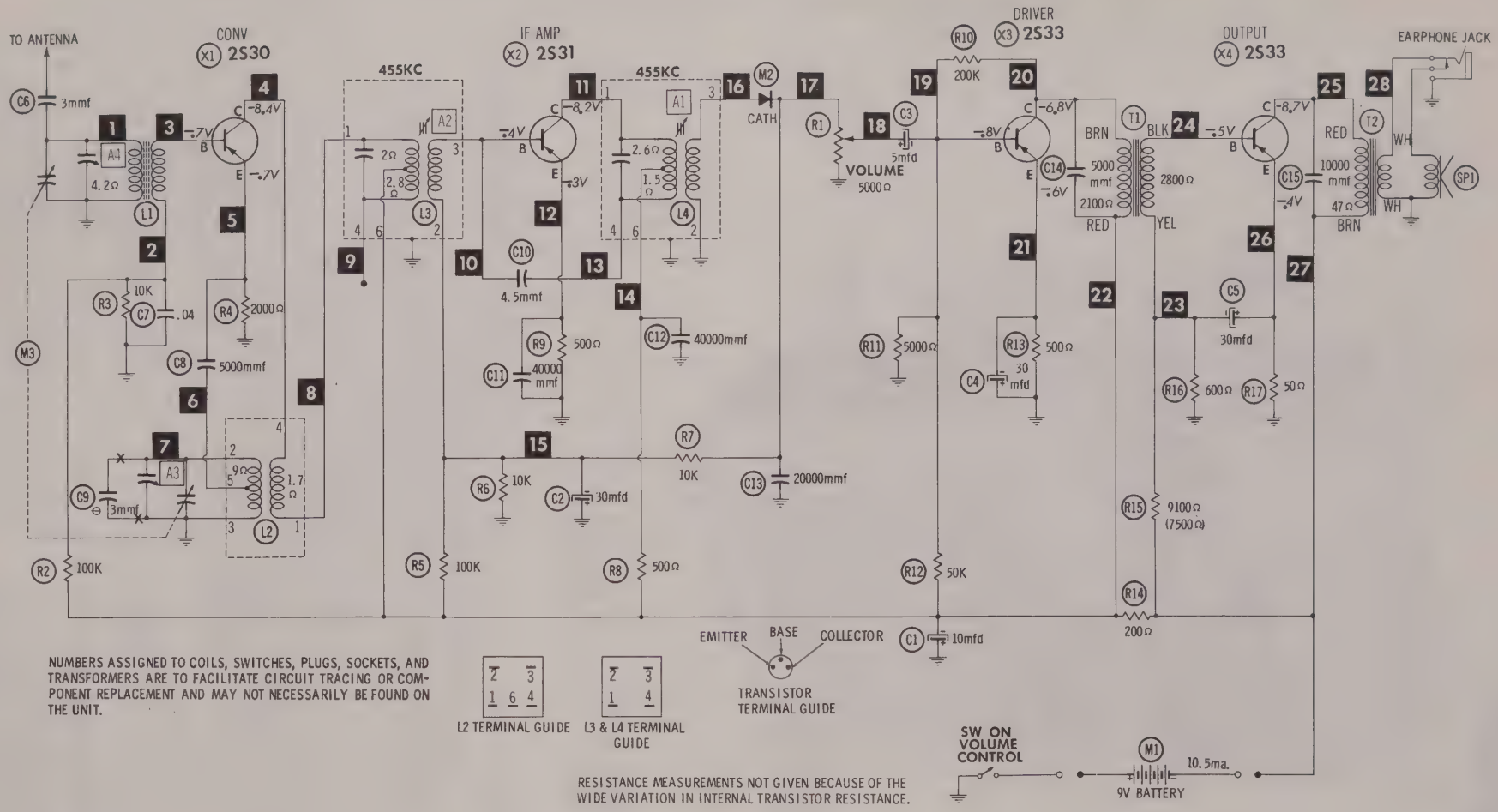

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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CONTINENTAL MODEL TR-100

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S30	Converter		2N412	2N486		PNP
X2	2S31	IF Amplifier		2N410	2N484		PNP
X3	2S33	Driver		2N408	2N362		PNP
X4	2S33	Output		2N408	2N631		PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10			NLW10-10				
C2	30	3			NLW30-6		ML25-3		
C3	5	3		XPP-3005	NLW5-6		ML5-6		
C4	30	3			NLW30-6		ML25-3		
C5	30	3			NLW30-6		ML25-3		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	3		NPO-SI 3	TCZ-3R3	C10V3R3	CCTO-3R3	CNO-533	10TCC-V33
C7	40000			DD-403	BYB6S4	1DP-2-403	GP-140	5HK-S40
C8	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C9	3	①	NPO-SI 3	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C10	4.5		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C11	40000			DD-403	BYB6S4	1DP-2-403	GP140	5HK-S40
C12	40000			DD-403	BYB6S4	1DP-2-403	GP140	5HK-S40
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	.2						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	100K	
R3	10K	
R4	2000Ω	
R5	100K	
R6	10K	
R7	10K	

ITEM No.	RATING	REMARKS
R8	500Ω	
R9	500Ω	
R10	200K	
R11	5000Ω	
R12	50K	
R13	500Ω	

ITEM No.	RATING	REMARKS
R14	200Ω	
R15	9100Ω	(7500Ω) *
R16	600Ω	
R17	50Ω	

* Alternate

PRINTED BOARD

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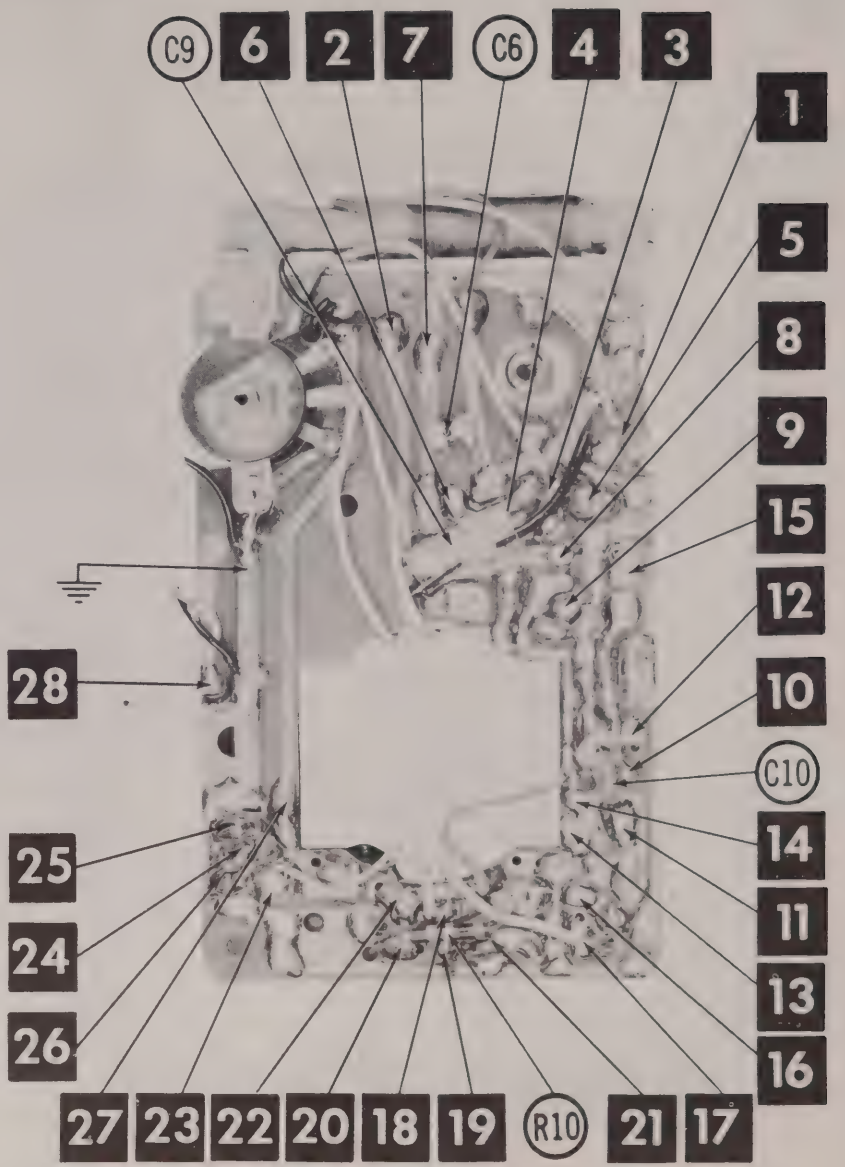


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Continental PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	Input IF							
L4	Output IF							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	T466						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	675Ω	12Ω	T467							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω			

BATTERIES

ITEM No.	VOLTAGE	Continental PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Continental PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2			1N60	1N60	1N60	Detector (Pigtail)

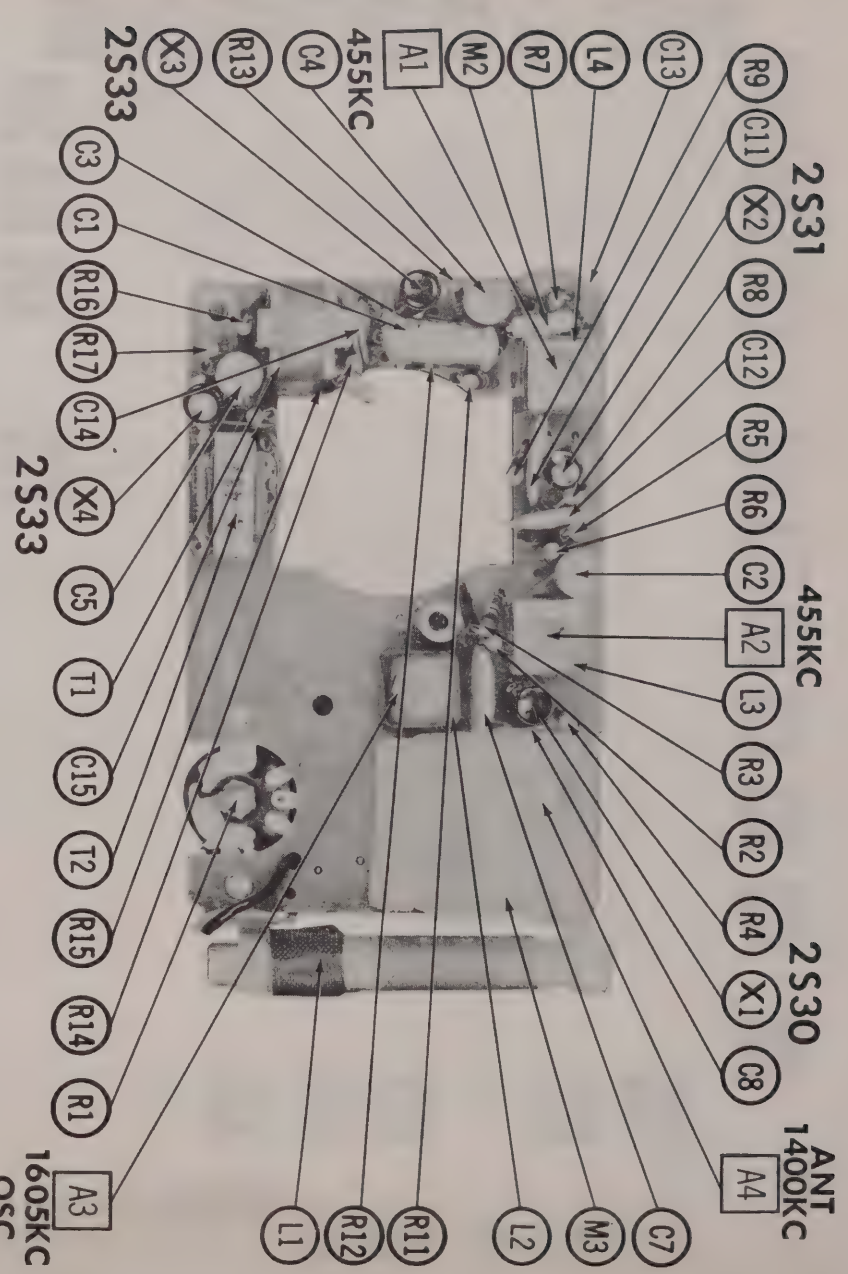
MISCELLANEOUS

ITEM No.	PART NAME	Continental PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW

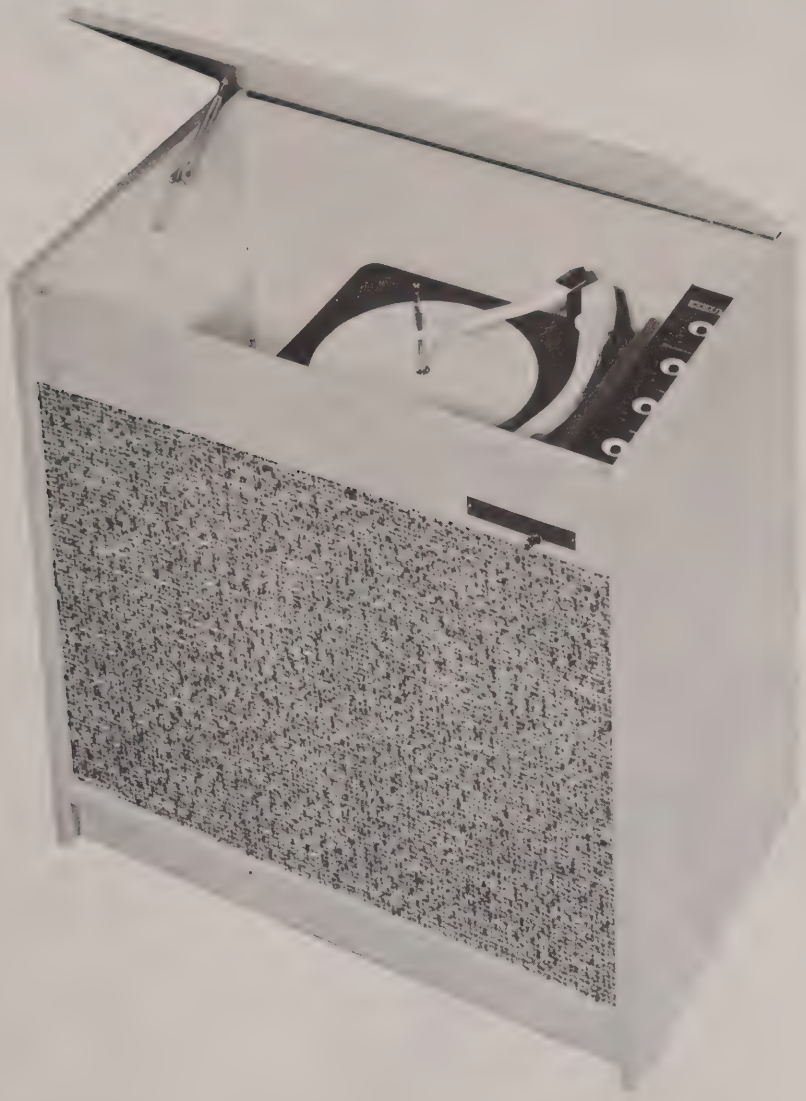


PHOTOFACT® Folder

EIA MEMBER

COLUMBIA
MODEL 672

COLUMBIA
MODEL 672



COLUMBIA
MODEL 672

TRADE NAME	Columbia Model 672
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier with 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 30 Watts, .34 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

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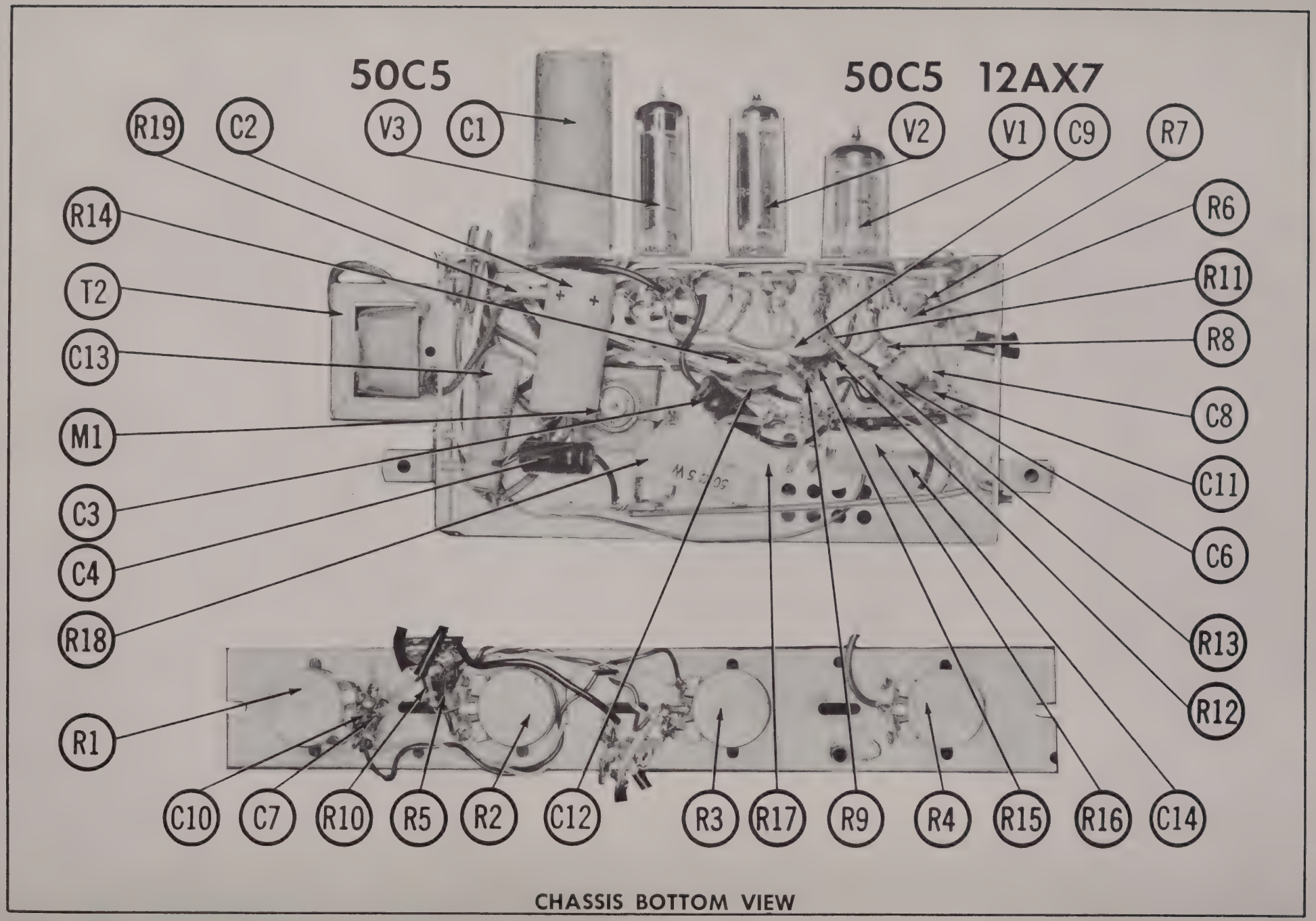


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel AF Amp. - Channel 2 AF Amp.	12AX7	V2	Channel 1 Output	50C5
			V3	Channel 2 Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	11A710	PRS2240	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	40	150	11A704	PRS1470	BR4015	TC48	TD-40-150	TVA-1413	
C3	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	①
C4	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	①
C5	4	50NP		NP-PRS7405	BBR8-150 †	TCN504		TVAS-1302.5*	②

① Some versions may use 20mfd @ 25V in this application (Part #11A739).
② Some versions may use 2mfd @ 50V in this application (Part #11A716).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C7	500		SI 500	D6-501	L10T5	CCD-501	UC-535	5GA-T50
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	500		SI 500	D6-501	L10T5	CCD-501	UC-535	5GA-T50
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	1/2	9A599	B-76	AD47-2meg-S	Q13-139	■ UE1874	Loudness, Channel 2
B	2meg	1/2		SR-76	Not Req.	M13-139		Loudness, Channel 1
C	Shaft			Not Req.	KSS-3	Not Req.		
R2A	5meg	1/2	9A595	B-88	AD47-5meg-S		▲ UE3967	Bass, Channel 2
B	5meg	1/2		SR-88	Not Req.			Bass, Channel 1
C	Shaft			Not Req.	KSS-3			
R3A	500K	1/2	9A597	B-59	AD47-500K-S	Q11-133	▲ UE1295	Treble, Channel 2
B	500K	1/2		SR-59	Not Req.	M11-133		Treble, Channel 1
C	Shaft			Not Req.	KSS-3	Not Req.		
R4A	10K	1/2	9A598	B-14	A47-10K-S	Q11-116	U20	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

■ "STA-LOC" Equivalent: FA26A, RU26A, CS3500.
▲ "STA-LOC" Equivalent: FA56A, RU56A, CS3500.
♦ "STA-LOC" Equivalent: FA55L, RU55L, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100K 5%	
R6	6.8meg	(10meg) *
R7	27K	
R8	330K	(270K) *
R9	470K	

ITEM No.	RATING	REMARKS
R10	100K 5%	
R11	6.8meg	(10meg) *
R12	27K	
R13	330K	(270K)*
R14	470K	

ITEM No.	RATING	REMARKS
R15	100Ω 1W	
R16	1100Ω 1W	
R17	125Ω 3W	(115Ω 10W) *
R18	50Ω 5W	
R19	39Ω	

* Alternate value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4500Ω CT	6-8Ω	3A232							
T2	1400Ω	1-2Ω	3A233							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA COLUMBIA PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3-4Ω	1B121	12A6A	
SP2	4"	PM	3-4Ω	1A116		
SP3	4"	PM	3-4Ω	1A116		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	COLUMBIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.082A	10A612 ①	RS100A ①	110A ①	100A ①	SR200 ②	① Selenium Type ② Silicon Type.

PHONO CARTRIDGE

ITEM No.	COLUMBIA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		13TB	Not Req.	66*	Not Req.			8TA4-S	N-8TA-S

* Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	COLUMBIA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		W-103STSS † or W-103STDS † ♦	CS-1X † or CS-1XD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M4	Switch	19A624	Stereo-Monaural (SPDT, Slide Type)

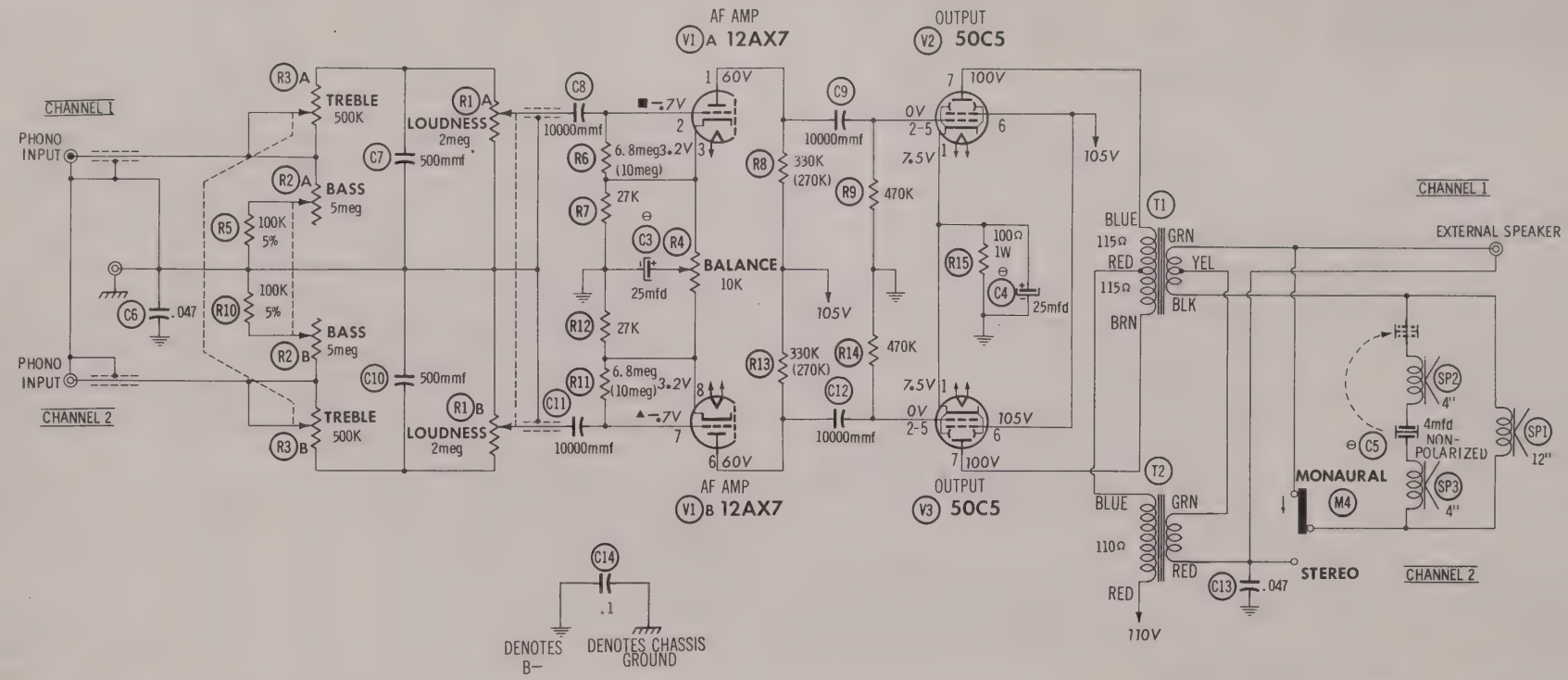
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8A476	4 Used
Cabinet	17A969	Mahogany
Cabinet	17A970	Blonde
Cabinet	17A971	Walnut
Escutcheon	18A367	

WIRING DATA

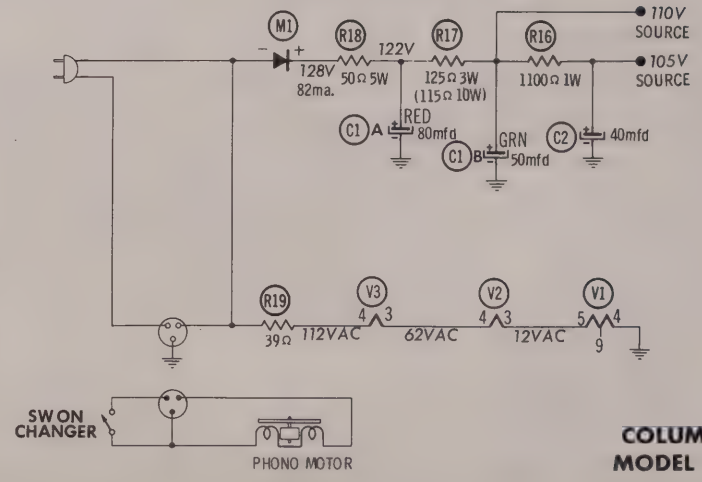
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†330K	10meg	27K	0Ω	12Ω	†330K	10meg	27K	6Ω
V2	50C5	100Ω	470K	12Ω	62Ω	470K	†1300Ω	†400Ω		
V3	50C5	100Ω	470K	62Ω	112Ω	470K	†1300Ω	†400Ω		

† MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM PIN 3 OF V1.
▲ MEASURED FROM PIN 8 OF V1.



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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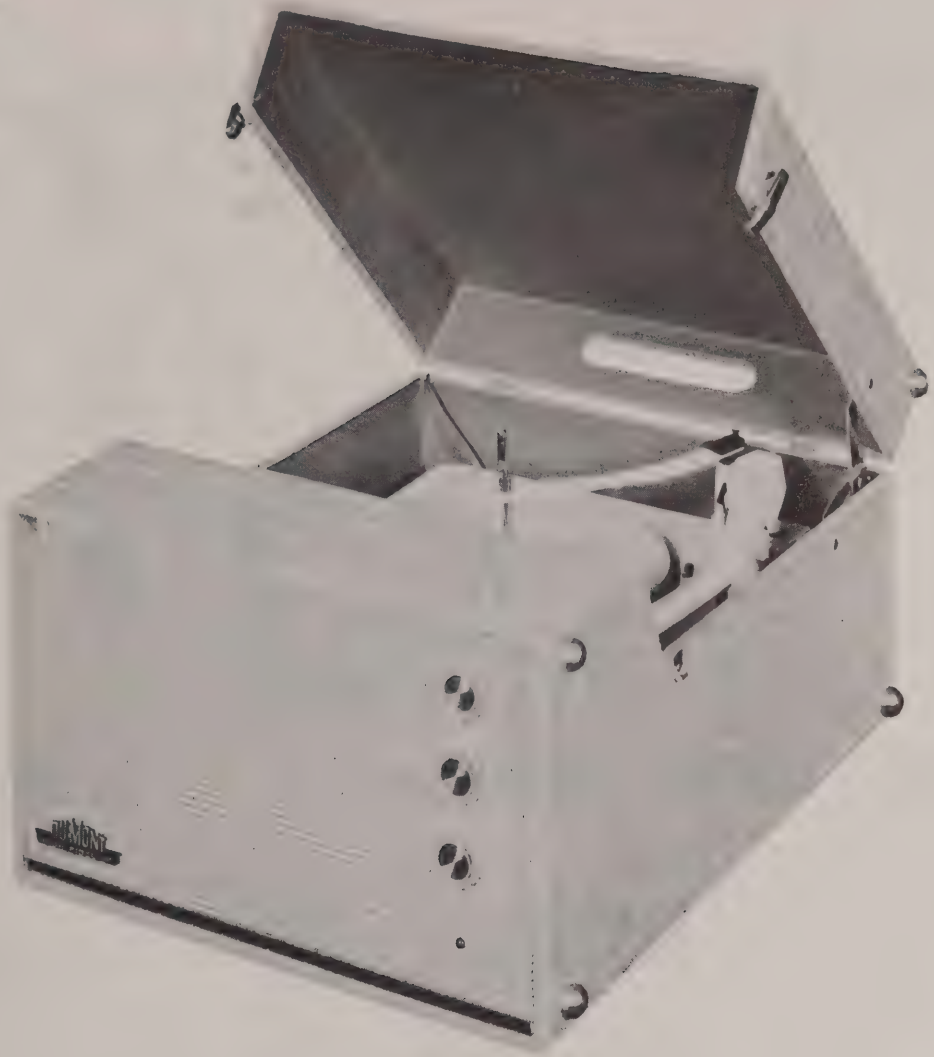
COLUMBIA MODEL 672

PHOTOFACT® Folder

DUMONT MODEL RA-504 (Vagabond)

DUMONT MODEL
RA-504 (Vagabond)



DUMONT MODEL
RA-504 (Vagabond)

TRADE NAME	Dumont Model RA-504 (Vagabond)
MANUFACTURER	Dumont Tel. & Radio Corp., 14th & Coles Streets, Jersey City 2, N. J.
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 34 Watts, .41 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #19035181 — SEE SIMILAR V-M1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amp. -Phase Inv.	12AX7	V3	Output	50C5
V2	Output	50C5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DUMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	03160063	PRS2240	BBRT84215	TCT3117	TDLD-13	TVA-3455	
B	60	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C3	220		DI-220	DD-221	L10T22	CCD-221	B-322	5GA-T22
C4	68		SI 68	DD-680	L10Q68	CCD-680	UC-5468	5GA-Q68
C5	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C6	33 N750		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C9	.022 200V		P288N-022		CUB2S22	4DP-2-223	GEM-4122	2TM-S22
C10	1000 10%		DI-1000	DD-102	1R5D1	CCS-102	JL-210	10TS-D10
C11	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C12	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C13	.33 200V		P288N-33		WMF2P33E	2DP-5-334	GEM-2033	2WF-P33
C14	.1 200V		P288N-1	DF-104	CUB2P1	2DP-4-104	GEM-201	2TM-P1
C15	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DUMONT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	3meg 1.7meg Tap	½	01072191	BT-82		Q18-140X		Volume
R2A	1meg	½	01072192	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	3meg	½	01072193	B-84	A47-3meg-S	Q11-140	U59	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

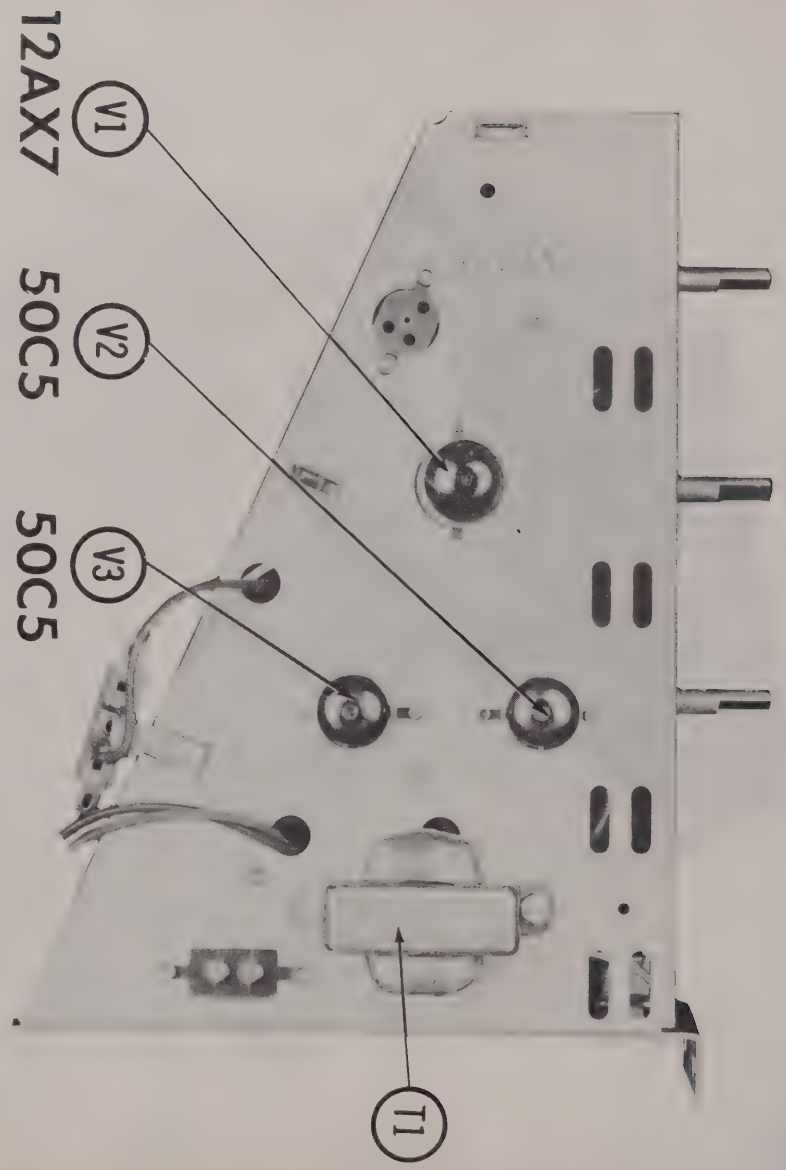
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	220K	
R5	150K	
R6	4.7meg	
R7	270K 5%	
R8	220Ω	
R9	390K	
R10	270K 5%	

ITEM No.	RATING	REMARKS
R11	2200Ω	
R12	390K	
R13	47K	
R14	470K	
R15	47K	
R16	82Ω 1W	
R17	1000Ω	

ITEM No.	RATING	REMARKS
R18	4700Ω	
R19	100K 5%	
R20	1000Ω 2W	
R21	12Ω 2W	
R22	43Ω 5% 1W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA DUMONT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2900Ω	4Ω SEC. 2 3-4Ω	20010402							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA DUMONT PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	18004183	8A31	
SP2	Electrostatic			89015854		
SP3	Electrostatic			89015854		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA DUMONT PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.105A	26001931 ①	RS150 ①	1235AH ①	150 ①	SR200 ②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA DUMONT PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	19035251	93-TX	Not Req.	*EV-56	Not Req.				

* Use PT-2 Mount.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA DUMONT PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		* W-201DS ♦† or * W-201TPS †		† Jewel ♦ Diamond * Includes Cartridge

CABINETS & CABINET PARTS

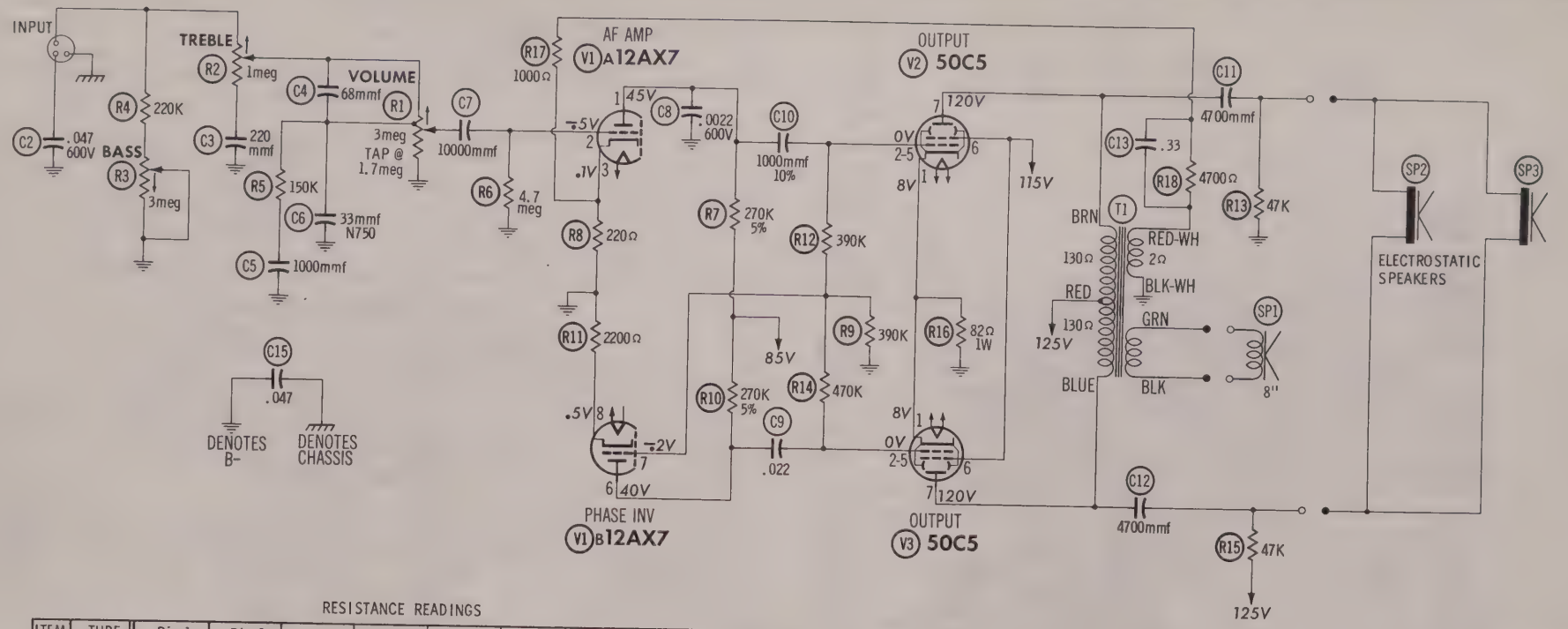
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	45009513	Volume
Knob	45009512	Bass
Knob	45009511	Treble
Cabinet	33038471	Saddle Tan
Cabinet	33038472	Tweed
Cabinet	33038473	Alligator

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

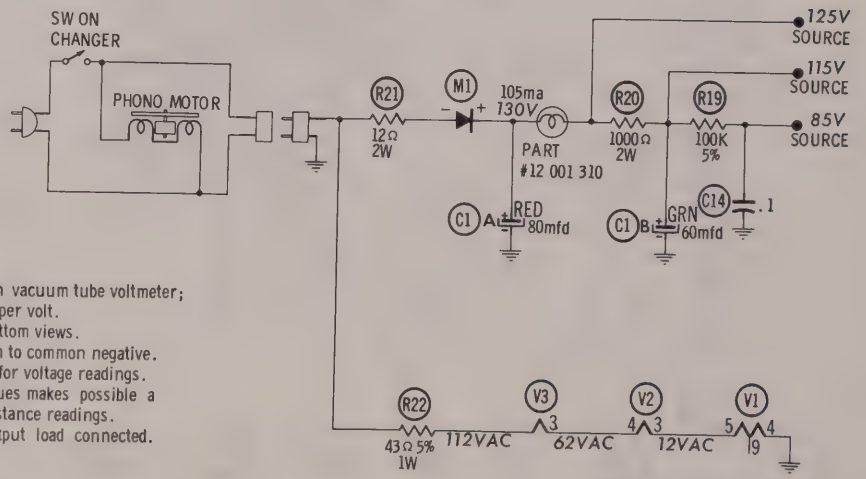
CHASSIS BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†370K	4.7meg	220Ω	0Ω	12Ω	†370K	390K	2200Ω	6Ω
V2	50C5	82Ω	780K	12Ω	62Ω	NC	†1000Ω	†130Ω		
V3	50C5	82Ω	860K	62Ω	112Ω	NC	†1000Ω	†130Ω		

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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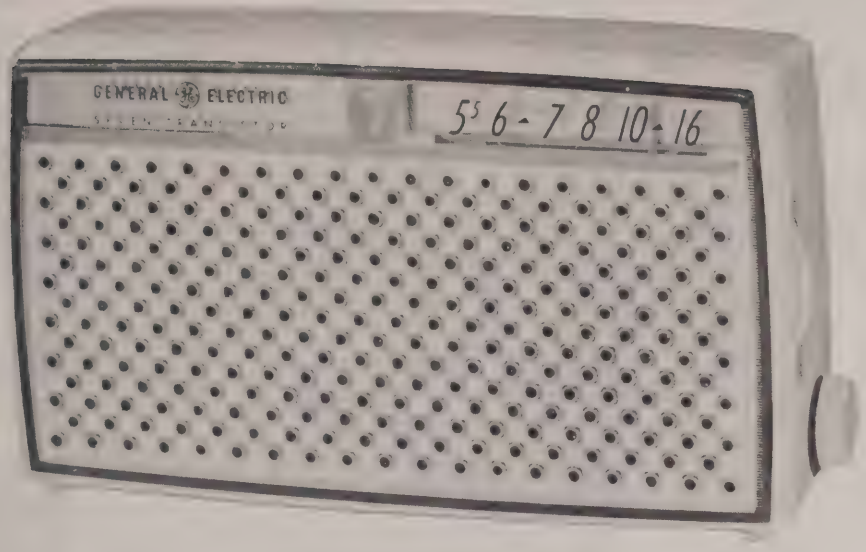
DUMONT MODEL RA-504 (Vagabond)

PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC
MODELS P785A, P786A, P787A

GENERAL ELECTRIC
MODELS P785A, P786A, P787A



MODEL P787A

GENERAL ELECTRIC
MODELS P785A, P786A, P787A

TRADE NAME	General Electric Models P785A, P786A, P787A
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad Street, Utica, N.Y.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	3 Volt DC
TUNING RANGE—BROADCAST	535-1620KC
RATING	12MA @ 3 Volts DC (No signal, Min. Volume) 60MA @ 3 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

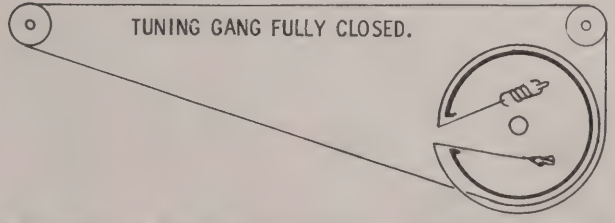
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A6 .. GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A4, A5 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A4	"
3.		"	1400KC	Tune to 1400KC signal	"	A5	Adjust for maximum output while rocking tuning gang.
4.		"	580KC	Tune to 580KC signal	"	A6	"

DIAL CORD STRINGING



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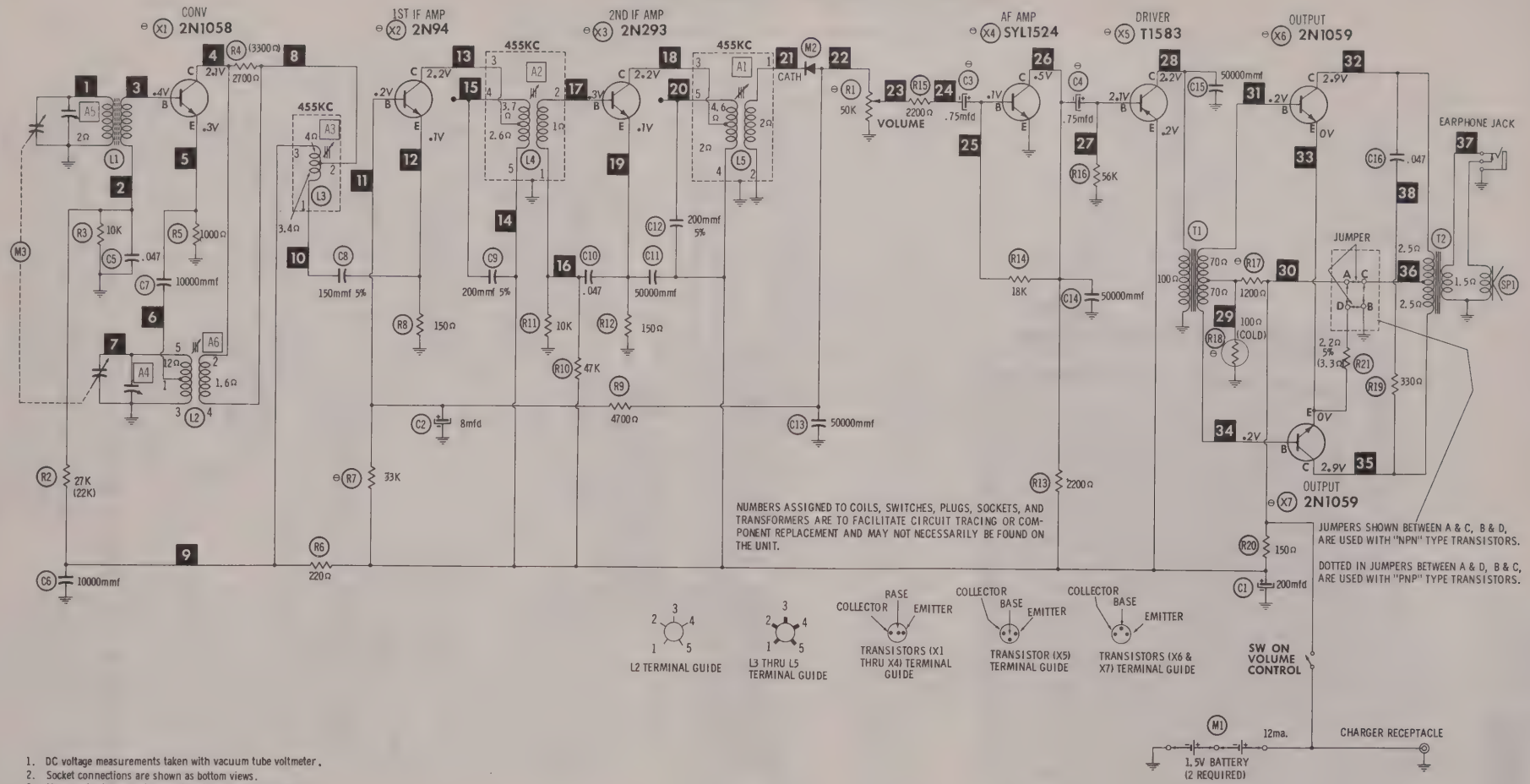
JF437

SET 469 FOLDER 7


CONV
⊖ X1 2N1058
1ST IF AMP
⊖ X2 2N94
2ND IF AMP
⊖ X3 2N293
AF AMP
⊖ X4 SYL1524
DRIVER
⊖ X5 T1583
OUTPUT
⊖ X6 2N1059
455KC
455KC
455KC
CATH
VOLUME
EARPHONE JACK
JUMPER
OUTPUT
⊖ X7 2N1059
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
JUMPERS SHOWN BETWEEN A & C, B & D, ARE USED WITH "NPN" TYPE TRANSISTORS.
DOTTED IN JUMPERS BETWEEN A & D, B & C, ARE USED WITH "PNP" TYPE TRANSISTORS.
L2 TERMINAL GUIDE
L3 THRU L5 TERMINAL GUIDE
TRANSISTORS (X1 THRU X4) TERMINAL GUIDE
TRANSISTOR (X5) TERMINAL GUIDE
TRANSISTORS (X6 & X7) TERMINAL GUIDE
SW ON VOLUME CONTROL
1.5V BATTERY (2 REQUIRED)
12ma.
CHARGER RECEPTACLE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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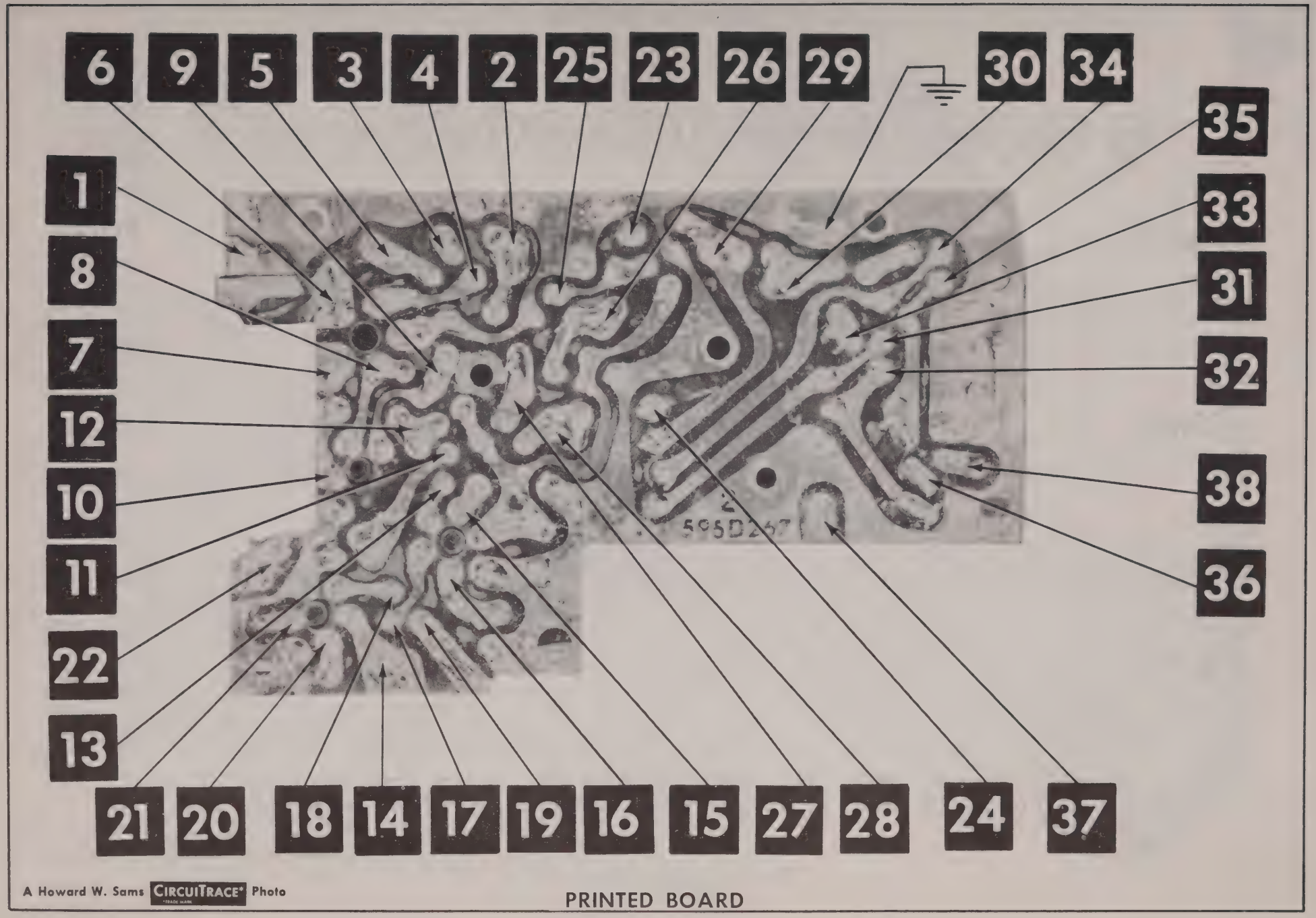
GENERAL ELECTRIC
MODELS P785A, P786A, P787A



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PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1058 ①	Converter	2N438			2N1058	NPN
X2	2N94	1st IF Amp.	2N439			2N94	NPN
X3	2N293 ②	2nd IF Amp.	2N439			2N94	NPN
X4	SYL1524 ③	AF Amp.				SYL1524	NPN
X5	T1583 ④	Driver					PNP
X6	2N1059 ⑤	Output	2N438A	2N647		2N1059	NPN } Matched Pair
X7	2N1059 ⑤	Output	2N438A	2N647		2N1059	NPN }

① Alternate type SYL1297.
② Alternate type 2N314, 2N515.
③ Alternate type 4JX2A816.
④ Alternate type 4JX1E825.
⑤ Some versions may use PNP type 2N408 in this application, when a 2N408 is used a jumper wire is connected between points "B" and "C" (see wiring diagram) R21 is soldered between points "A" and "D" (see wiring diagram), R17 is a 100Ω thermistor, R18 is 1500Ω.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G E PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	200	6	RS-1997	BCD6200	ECPA121			VL-1108	
C2	8	6	RS-1462	PWE6008	EC8-6	TT6X8	ML8-6	TE-1086	
C3	.75	50		PWE50001	EC1-6	TT12X1	ML1-50	TE-1300	Note 1
C4	.75	50		PWE50001	EC1-6	TT12X1	ML1-50	TE-1300	Note 1

Note 1. Some versions may use .75mfd @ 6V in this application (Part #RS-2083).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.047 50V		V84C2S47	DDA-503	WMF1S47E	1DP-2-473	TA-150	2WF-S47
C6	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C7	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C8	150 5%		ADM15-151	TCZ-150	22R5T15	CM-20B-151J	CNO-315	10TCC-T15
C9	200 5%		ADM15-201	TCZ-200	22R5T2	CM-20B-201J		10TCC-T20
C10	.047 50V		V84C2S47	DDA-503	WMF1S47E	1DP-2-473	TA-150	2WF-S47
C11	50000		BPD-05	DDA-503	H-05S5	1DP-2-503	TA-150	TG-S50
C12	200 5%		ADM15-201	TCZ-200	22R5T2	CM-20B-201J	10TCC-T20	
C13	50000		BPD-05	DDA-503	H-05S5	1DP-2-503	TA-150	TG-S50
C14	50000		BPD-05	DDA-503	H-05S5	1DP-2-503	TA-150	TG-S50
C15	50000		BPD-05	DDA-503	H-05S5	1DP-2-503	TA-150	TG-S50
C16	.047 50V		V84C2S47	DDA-503	WMF1S47E	1DP-2-473	TA-150	2WF-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G E PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B	50K Switch	1/4	RS-1993					Volume, Note 1

Note 1. Some versions may use 100K in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	27K	(22K)*
R3	10K	
R4	2700Ω	(3300Ω)*
R5	1000Ω	
R6	220Ω	
R7	33K	①
R8	150Ω	

ITEM No.	RATING	REMARKS
R9	4700Ω	
R10	47K	
R11	10K	
R12	150Ω	
R13	2200Ω	
R14	18K	
R15	2200Ω	

ITEM No.	RATING	REMARKS
R16	56K	
R17	1200Ω	②
R18	100Ω Cold	#RS-1995 ②
R19	330Ω	
R20	150Ω	
R21	2.2Ω 5%	(3.3Ω)*

* Alternate value. # Manufacturer's Part No.
① Transistor 2N94 coded 132 uses 27K in this application.
② When Output Transistor is PNP type 2N408, R17 and R18 reverse positions in circuit. R17 may be 1500Ω.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		G E PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	RS-1994						
L2	Osc. Coil	RS-1990						
L3	1st IF Trans.	RS-1987						
L4	2nd IF Trans.	RS-1988						
L5	3rd IF Trans.	RS-1989						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	G E PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	RS-1986	TR-2		TA-30	TR-2	T-33X ①	① Remove frame.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G E PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	100Ω CT	16Ω	RS-1985							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G E PART No.	QUAM PART No.	
SP1	2 3/4"	PM	15-17Ω	RS-1991		

BATTERIES

ITEM No.	VOLTAGE	G E PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			Z ①		1015 ①		M15 ①	① 2 Required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		G E PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2			1N60	1N60	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	G E PART No.	NOTES
M3	Tuning Cap.	RS-1992	2 Gang (Ant. 13-123mmf, Osc. 5-90mmf)

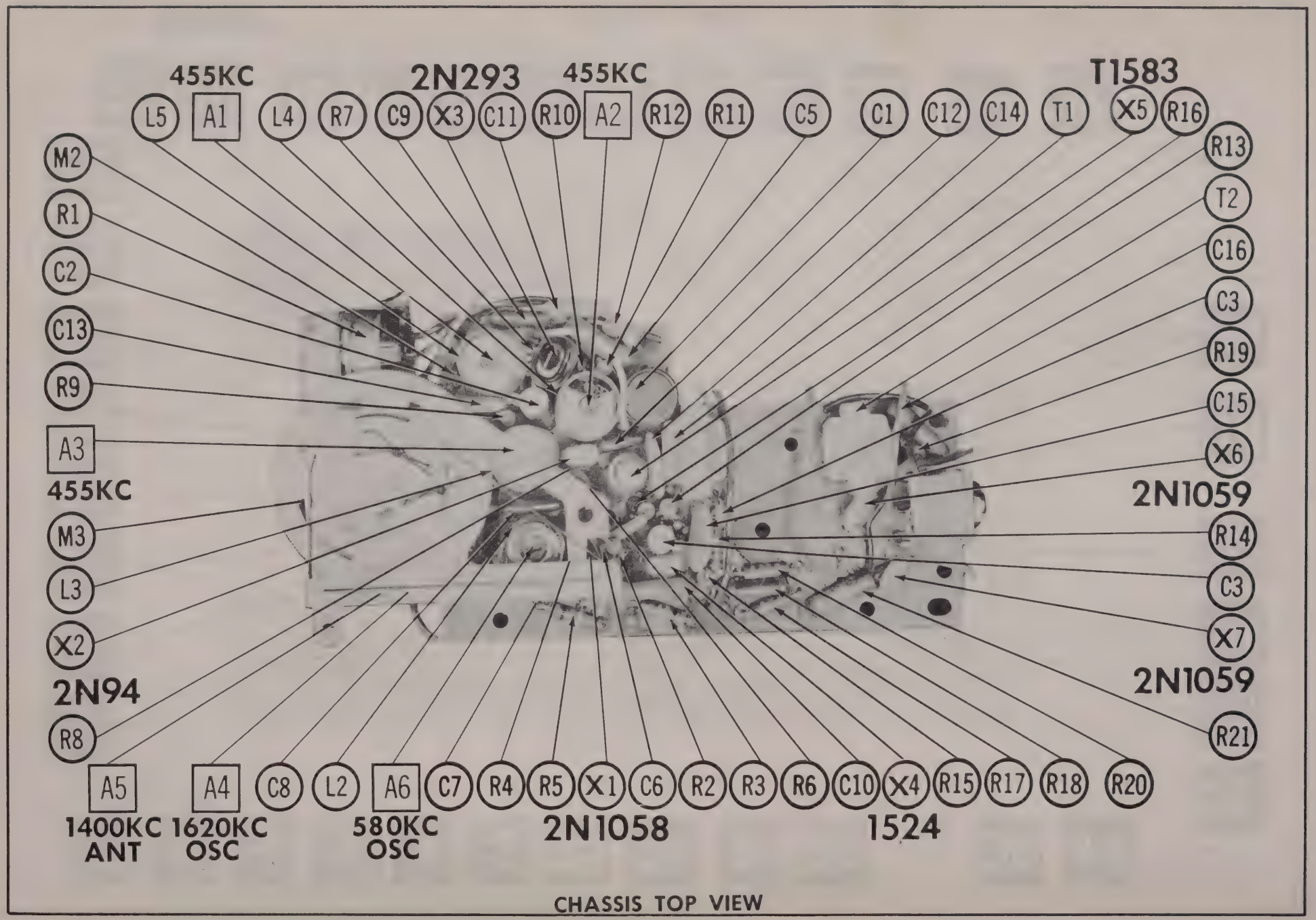
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-1968	Tuning
Knob	RS-1969	Volume, Model P785
Knob	RS-1970	Volume, Model P786
Knob	RS-1971	Volume, Model P787
Pointer	RS-1977	
Dial Insert	RS-1972	Left Hand
Dial Insert	RS-1973	Right Hand
Cabinet Front	RB-1098	Complete
Cabinet Back	RB-1099	Complete, Model P785
Cabinet Back	RB-1100	Complete, Model P786
Cabinet Back	RB-1101	Complete, Model P787

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS TOP VIEW

PHOTOFACT® Folder

**GROMMES
MODEL 214**

GROMMES
MODEL 214

GROMMES
MODEL 214

TRADE NAME	Grommes Model 214
MANUFACTURER	Precision Electronics Inc., 9101 King Ave., Franklin Park, Illinois
TYPE SET	AC Operated 5 Tube Stereo Preamplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 22 Watt, .25 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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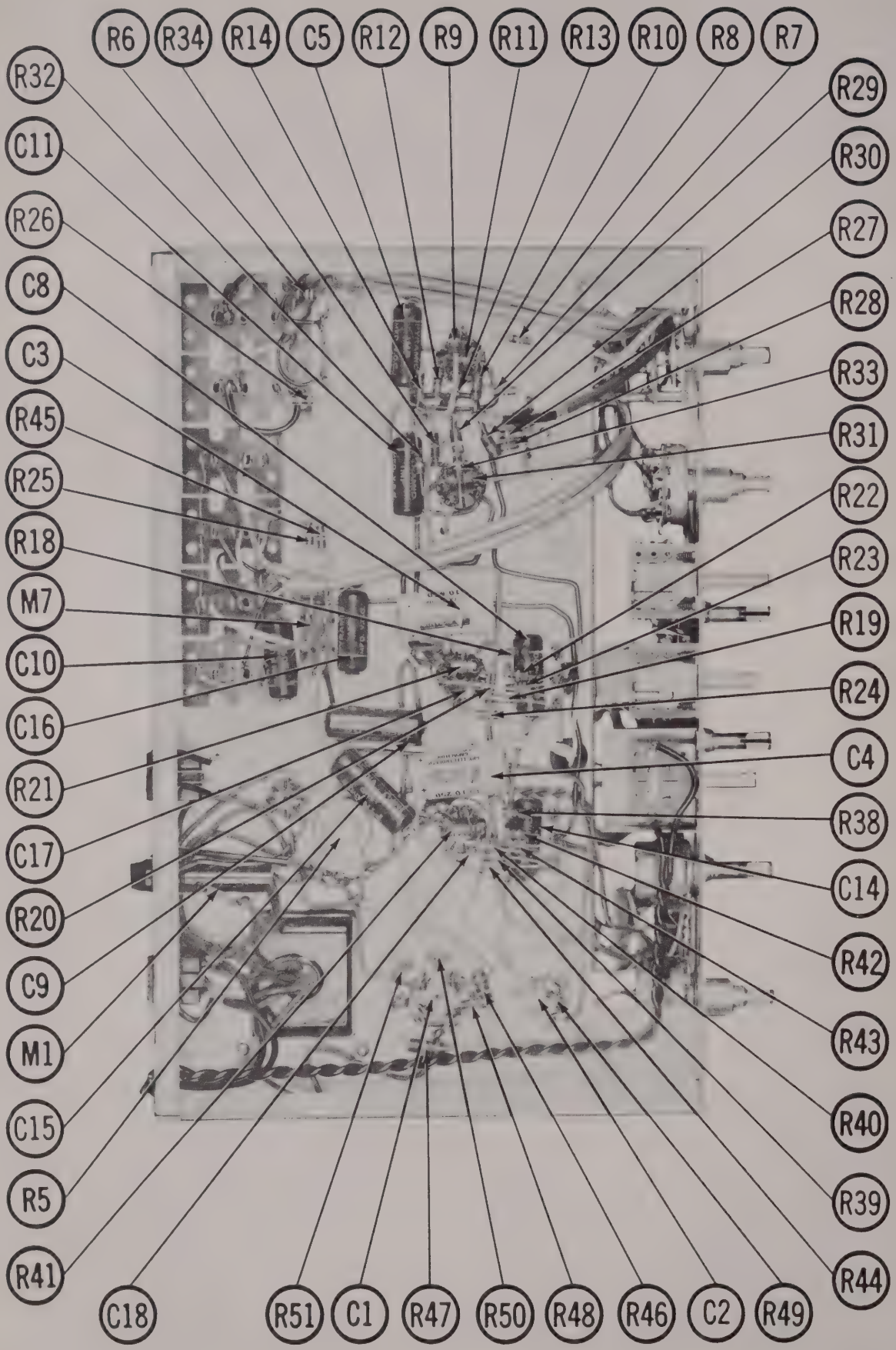


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Channel A Preamplifier	12AX7 (7025, ECC83)*
V2	Channel A AF Amplifier	7199 (6AN8) *
V3	Channel B Preamplifier	12AX7 (7025, ECC83)*
V4	Channel B AF Amplifier	7199 (6AN8) *
V5	Rectifier	6X4 (EZ80/6V4) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400		AFH4-78	D0640	FP429	TMQ-92	TVL-4734	
B	■30	350							
C	▲10	300							
D	20	25							
C2A	■10	350		AFH2-47	B0370	FP231	TMD-47	TVL-2750	
B	▲10	350							
C3	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	
C4	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C7	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C8	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C10	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C11	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C12	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C13	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C16	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	5 ① 10%		NPO-SI 5	D6-050	L10V5	CCTO-050	ZT-555	10TCC-V5
C18	5 ① 10%		NPO-SI 5	D6-050	L10V5	CCTP-050	ZT-555	10TCC-V5
C19	470 ①		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C20	470 ①		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47

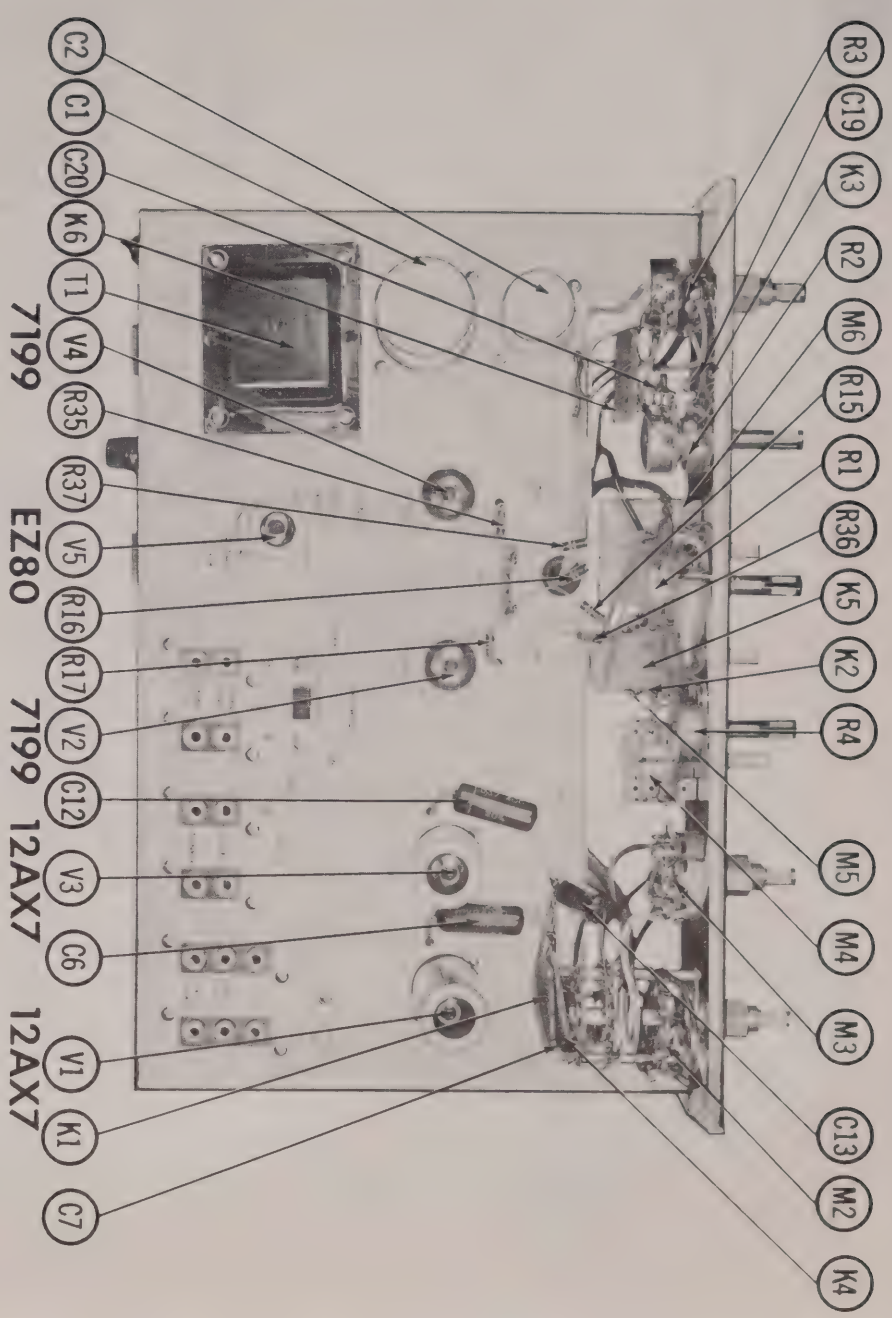
① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K *	½	LCK-500KS				■ UE4024	Loudness, Channel B
B	500K *	½						Loudness, Channel A
R2A	1meg	½	TCK-1MS	B-69	AD47-1meg-S	Q11-137		Bass, Channel B
B	1meg	½		SR-69	Not Req.	M11-137	† UE1706	Bass, Channel A
C	Shaft			Not Req.	KSS-3	Not Req.		
R3A	1meg	½	TCK-1MS	B-69	AD47-1meg-S	Q11-137		Treble, Channel B
B	1meg	½		SR-69	Not Req.	M11-137	† UE1706	Treble, Channel A
C	Shaft			Not Req.	KSS-3	Not Req.		
R4A	1meg	½	TCK-1M	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	100Ω	½	CLU-100	AB-1			UI	Hum Adjust
B	Shaft			AK-1			Not Req.	

* Taps @ 100K, 200K.
† "STA-LOC" Equivalent: FA16L, RU16L, CS3500.
■ "STA-LOC" Equivalent: FB55DT25, RU55DT25, CS3500.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	4.7meg	
R7	100K	
R8	10K	
R9	100K	
R10	1000Ω	
R11	18K	
R12	1meg	
R13	100K	
R14	1000Ω	
R15	100K	
R16	22K	
R17	100K	
R18	1meg	
R19	220K	
R20	470K	
R21	270K	

ITEM No.	RATING	REMARKS
R22	270Ω	
R23	470K	
R24	100K	
R25	150K	
R26	4.7meg	
R27	100K	
R28	10K	
R29	100K	
R30	1000Ω	
R31	18K	
R32	1meg	
R33	100K	
R34	1000Ω	
R35	100K	
R36	22K	
R37	100K	

ITEM No.	RATING	REMARKS
R38	1meg	
R39	220K	
R40	470K	
R41	270K	
R42	270Ω	
R43	470K	
R44	100K	
R45	150K	
R46	2700Ω 1W	
R47	2700Ω 1W	
R48	4700Ω	
R49	22K	
R50	470K	
R51	22K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GROMMES PART No.	REPLACEMENT DATA
K1	Channel A Tone Comp.	800mmf, 2000mmf, 3000mmf, 33K, 100K, 100K, (2) 3.3meg	PC-1960	
K2	Channel A Loudness Comp.	50mmf, 10000mmf, 10000mmf, 22K, 47K, 470K	LC-195	
K3	Channel A Tone Comp.	470mmf, 3000mmf, 3000mmf, 10K, 68K, 68K, 68K	TC-190	
K4	Channel B Tone Comp.	800mmf, 2000mmf, 3000mmf, 33K, 100K, 100K, (2) 3.3meg	PC-1960	
K5	Channel B Loudness Comp.	50mmf, 10000mmf, 10000mmf, 22K, 47K, 470K	LC-195	
K6	Channel B Tone Comp.	470mmf, 3000mmf, 3000mmf, 10K, 68K, 68K, 68K	TC-190	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .25A	620VCT @ .010A	6.3V @ 2A	TP-207A						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	½A 250V			312.500 (3AG ½A 250V)	342001	AGC ½	HKP

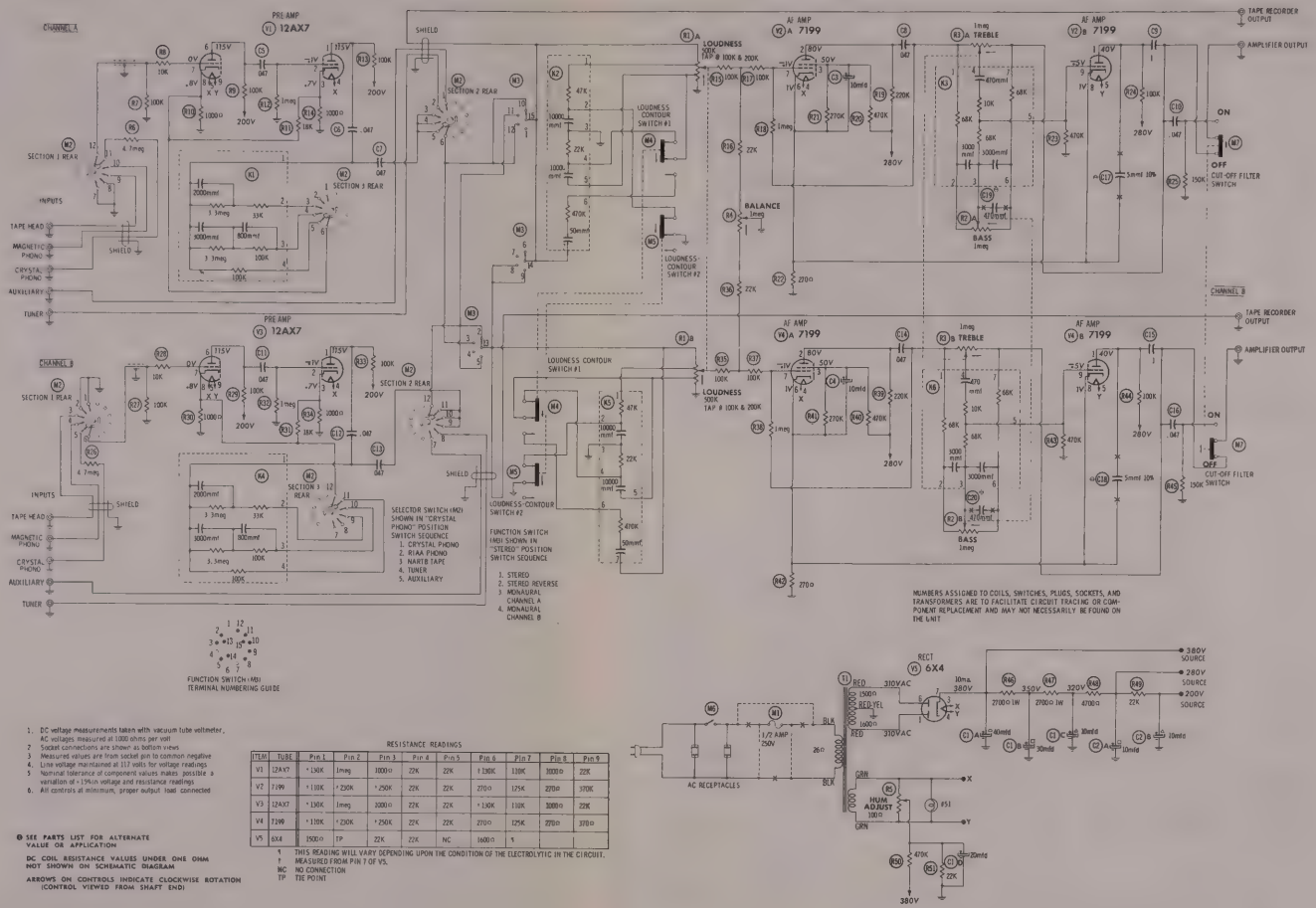
MISCELLANEOUS

ITEM No.	PART NAME	GROMMES PART No.	NOTES
M2	Switch		Selector
M3	Switch		Function
M4	Switch		Loudness Contour (DPDT, Slide Type)
M5	Switch		Loudness Contour (DPDT, Slide Type)
M6	Switch		Power, Off-On
M7	Switch		Cut off Filter (DPDT, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±5% in voltage and resistance readings
6. All controls at minimum, proper output load connected

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	*1.5MΩ	1meg	1000Ω	22K	22K	†330K	110K	1000Ω	22K
V2	7199	*110K	*250K	*250K	22K	22K	270Ω	125K	270Ω	370K
V3	12AX7	*1.5MΩ	1meg	1000Ω	22K	22K	*1.5MΩ	110K	1000Ω	22K
V4	7199	*110K	*250K	*250K	22K	22K	270Ω	125K	270Ω	370Ω
V5	6X4	1500Ω	TP	22K	22K	NC	1600Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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BROMMES MODEL 214

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA
MODELS L13S, W (Ch. HS-729)

MOTOROLA
MODELS L13S, W (Ch. HS-729)

MODEL L13S

TRADE NAME	Motorola Models L13S, L13W (Ch. HS-729)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	532 - 1620KC
RATING	10MA@9 Volts DC (No Signal, Min Volume) 11MA@9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A3..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A4..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	532KC	Tuning gang fully closed.	"	A4	"
3.		"	1620KC	Tuning gang fully open.	"	A5	Adjust for maximum output. Repeat Steps 2 and 3 until oscillator covers required range; Step 3 should be last adjustment.
4.		"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output.
5.		"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output. Repeat Step 4 and 5. until no further improvement is noted. Make step 4 last step performed. Cement antenna winding to core with wax.

DISASSEMBLY INSTRUCTIONS

1. Loosen 2 back panel screws 5 or 6 turns. Remove panel. (If necessary, press in bottom center edge to free panel).
2. Remove 2 screws from under batteries. Remove cabinet back.
3. Remove volume, tuning and pointer knobs.
4. Remove 2 dial scale screws. Remove dial.
5. Remove nut holding volume control.
6. Remove 2 screws from under dial scale.
7. Remove nut holding earphone jack.
8. Unsolder chassis leads. Remove chassis.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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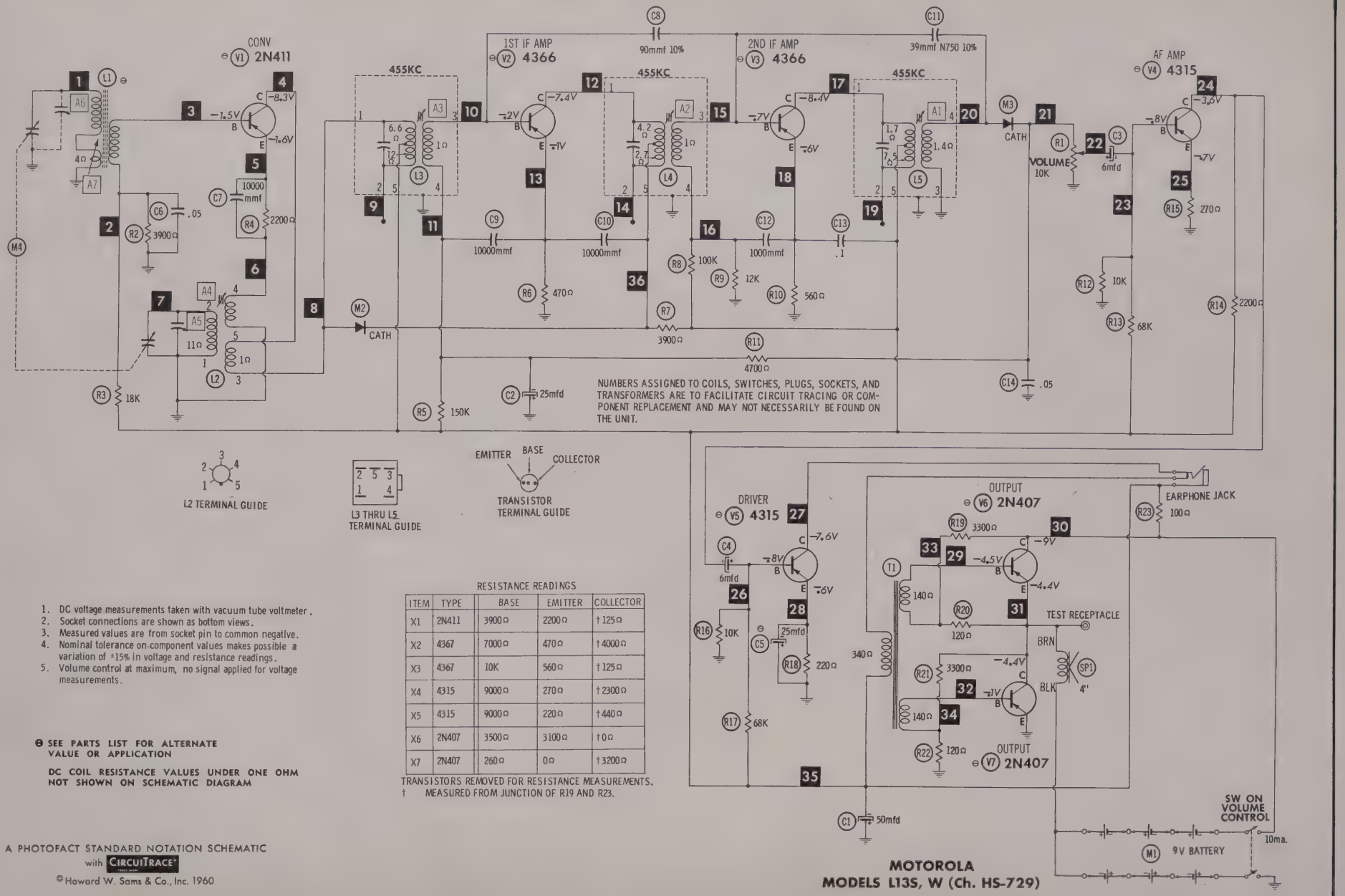
SET 469 FOLDER 9



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N411	3900Ω	2200Ω	†125Ω
X2	4367	7000Ω	470Ω	†4000Ω
X3	4367	10K	560Ω	†125Ω
X4	4315	9000Ω	270Ω	†2300Ω
X5	4315	9000Ω	220Ω	†440Ω
X6	2N407	3500Ω	3100Ω	†0Ω
X7	2N407	260Ω	0Ω	†3200Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R19 AND R23.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®
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MOTOROLA
MODELS L13S, W (Ch. HS-729)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N411 ①	Converter		2N411	2N486	2N411	PNP
X2	4366 ②	1st IF Amplifier		2N409	2N483		PNP
X3	4366 ②	2nd IF Amplifier		2N409	2N483		PNP
X4	4315 ③	AF Amplifier		2N407	2N362		PNP
X5	4315 ③	Driver		2N407	2N362		PNP
X6	2N407 ④	Output		2N407	2N632	2N407	PNP } Matched
X7	2N407 ④	Output		2N407	2N632	2N407	PNP } Pair

① Alternate Type #2N486 (B). ② Alternate Type #2N483(B). ③ Alternate Type #2N362(B)
④ Alternate Type #2N633 (B). Replace with same type originally used.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	50	15	23K643463	BCD15050	ECPA415	PET1575	ML50-15	VL-1174	
C2	25	10	23K642709	XPP-1025	NL25-10	TT10X25	ML30-15	TE-1118	
C3	6	10	23K636769	XPP-10006	NLW6-25	TT12X5	ML6-15	TE-1127.1	
C4	6	10	23K636769	XPP-10006	NLW6-25	TT12X5	ML6-15	TE-1127.1	
C5	25	10	23K642709	XPP-1025	NL25-10	TT10X25	ML30-15	TE-1118	Note 1

Note 1. Alternate Part #23K636454 25mfd@6V may be used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.05 200V		P288N-05	DF-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	90 10%			TCZ-91	L10Q91	CCD-101		10TS-Q91
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	39 N750 10%			TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39S
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	.1 50V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C14	.05 200V		P288N-05	DF-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	½	18B643549					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	3900Ω	
R3	18K	
R4	2200Ω	
R5	150K	
R6	470Ω	
R7	3900Ω	
R8	100K	
R9	12K	

ITEM No.	RATING	REMARKS
R10	560Ω	
R11	4700Ω	
R12	10K	
R13	68K	
R14	2200Ω	
R15	270Ω	
R16	10K	
R17	68K	

ITEM No.	RATING	REMARKS
R18	220Ω	
R19	3300Ω	
R20	120Ω	
R21	3300Ω	
R22	120Ω	
R23	100Ω	

PRINTED BOARD

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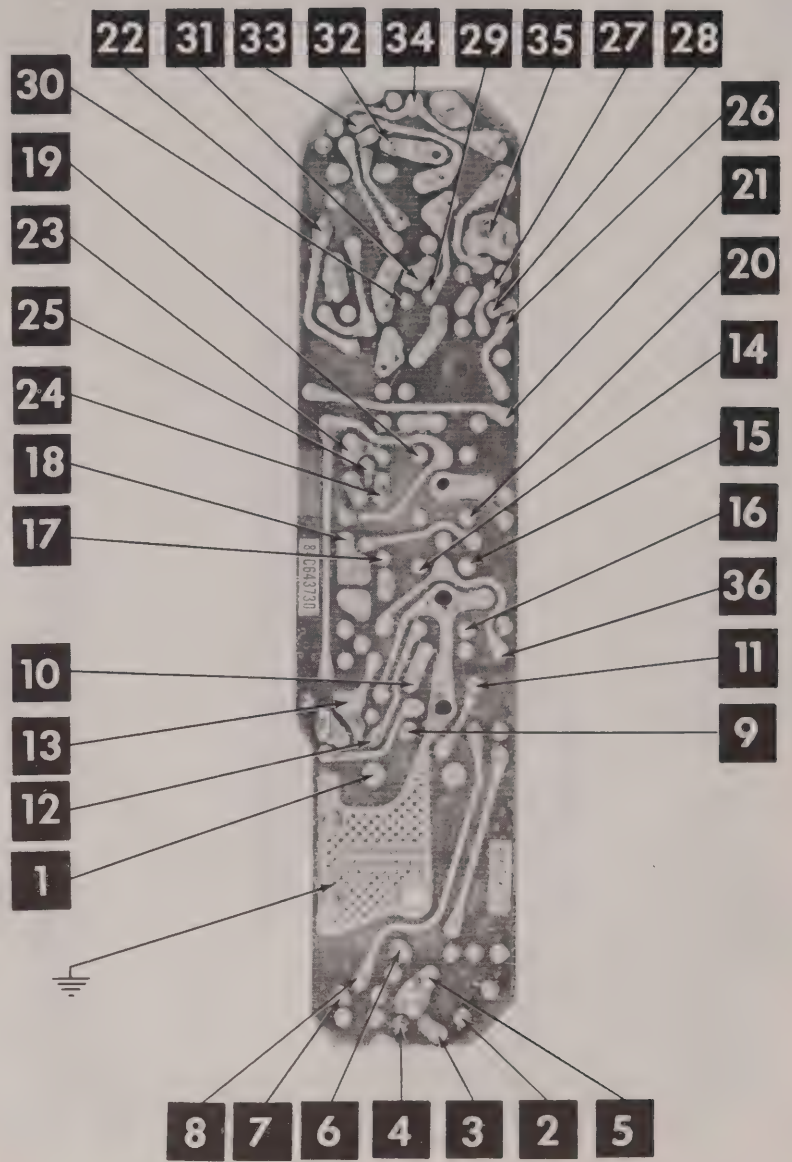


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	†						
L2	Osc. Coil	24B643467						
L3	1st IF Trans.	24D643556						
L4	2nd IF Trans.	24K643557						
L5	3rd IF Trans.	24K643558						

† Part of handle assembly. Model L13S uses Part #1V643655. Model L13W uses Part #1V643656.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	25B643559						
		SEC. 2							
	2.5	: 1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"	PM	42-44Ω	50C643469		

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			1		635		M-14M	6 required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		48K640754	1N60	1N60	1N60	AVC (Pigtail)
M3		48K640754	1N60	1N60	1N60	DET. (Pigtail)

MISCELLANEOUS

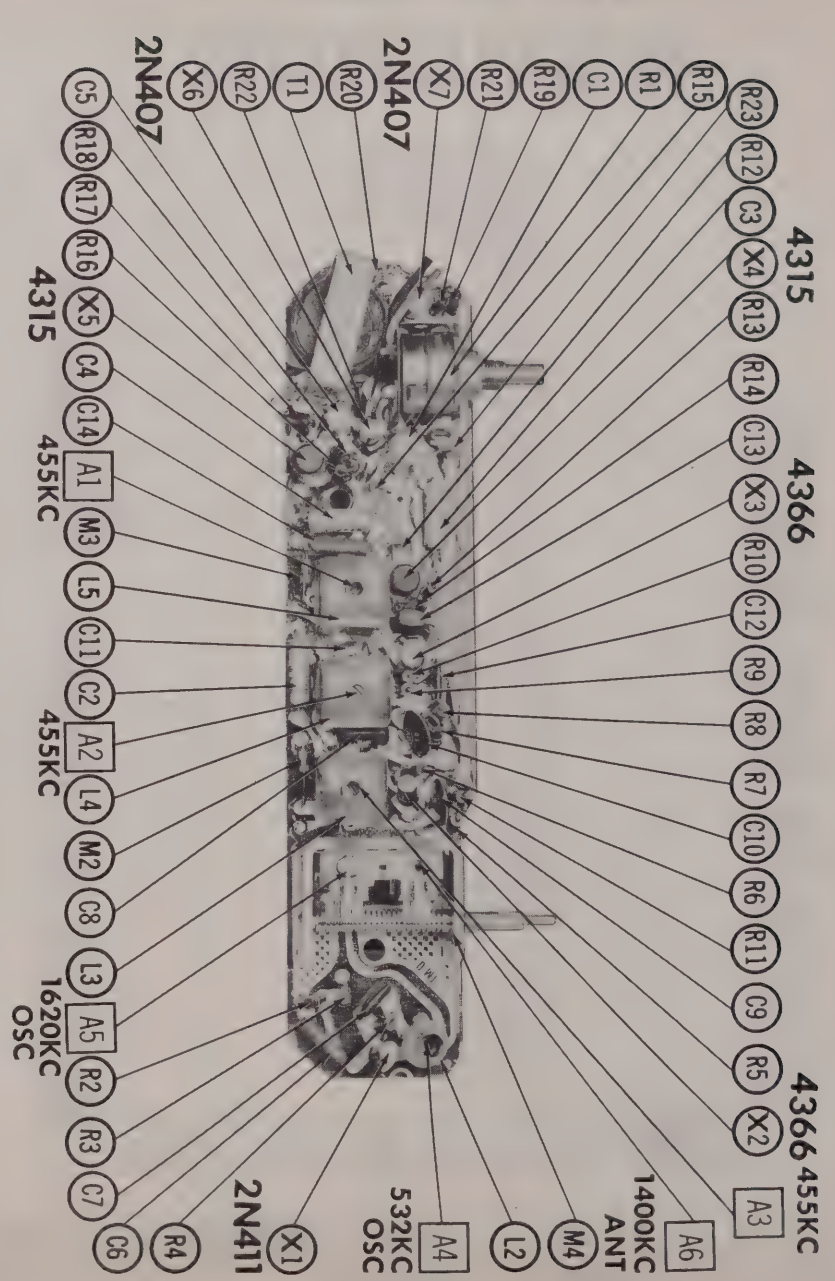
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Cap	19B643550	2 Gang
	Printed Board	84C643730	Less Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36K643621	Tuning, Model L13S
Knob	36B643620	Tuning, Model L13W
Knob	36K643623	Volume, Model L13S
Knob	36B643622	Volume, Model L13W
Knob	36C643624	Pointer
Dial Scale	34B644777	
Cabinet Back	1V643670	Model L13S
Cabinet Back	1V643673	Model L13W
Cabinet Front	1V643669	Model L13S
Cabinet Front	1V643672	Model L13W
Handle Assy.	1V643655	Includes L1, Model L13S
Handle Assy.	1V643656	Includes L1, Model L13W

CHASSIS—TOP VIEW



PHOTOFACT® Folder

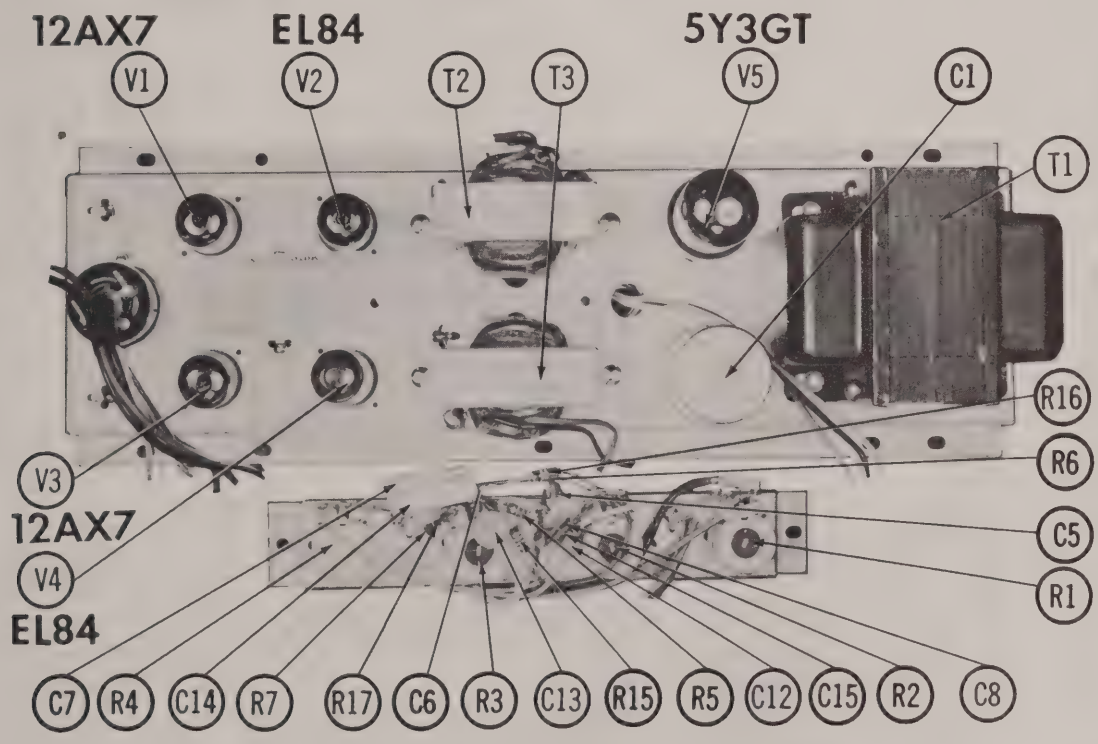
MOTOROLA
MODELS SH12E, N, S (Ch. HS-704)

MOTOROLA
MODELS SH12E, N, S (Ch. HS-704)

MODEL SH12E

TRADE NAME	Motorola Models SH12E, SH12N, SH12S (Ch. HS-704)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 5 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 70 Watts, .67 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER VM20RC, VM21RC or VM25RC — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT559

SET 469 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp.	12AX7
V2	Left Channel Output	EL84/6BQ5
V3	Right Channel AF Amp.	12AX7
V4	Right Channel Output	EL84/6BQ5
V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	23K642239	AFH4-04-50	D0034	FP420.38	TMQ-120	TVL-4635.3	
B	■40	350							
C	▲40	350							
D	40	350							
C2	50	10	23B636685	PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	①
C3	5	10VNP	23A632250	PRS7405	BBR10-25 †	TCN105		TVAS-1110 *	
C4	5	10VNP	23A632250	PRS7405	BBR10-25 †	TCN105		TVAS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 25mfd in this application, when replacing use 50mfd@10V.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	220 10%		DI-220	DD-221	L10T22	CCD-221	JL-322	10TS-T22
C6	2000 10%		DI-2000		PM6D2	CCS-202	JL-220	10TS-D20
C7	.02 400V		P488N-02	DF-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C8	2000 10%		DI-2000		PM6D2	CCS-202	JL-220	10TS-D20
C9	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C10	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C11	2000 10%		DI-2000		PM6D2	CCS-202	JL-220	10TS-D20
C12	220 10%		DI-220	DD-221	L10T22	CCD-221	JL-320	10TS-T22
C13	2000 10%		DI-2000		PM6D2	CCS-202	JL-220	10TS-D20
C14	.02 400V		P488N-02	DF-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C15	2000 10%		DI-2000		PM6D2	CCS-202	JL-220	10TS-D20
C16	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C17	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C18	2000 10%		DI-2000		PM6D2	CCS-202	JL-220	10TS-D20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg		18B642659	B-76	AD47-2meg-Z	Q13-139	■ UE1874	Loudness, Right Channel
B	2meg			SR-76	Not Req.	M13-139		Loudness, Left Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R2A	2meg		18B642659	B-76	AD47-2meg-Z	Q13-139		Treble, Right Channel
B	2meg			SR-76	Not Req.	M13-139	■ UE1874	Treble, Left Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	2meg		18B642659	B-76	AD47-2meg-Z	Q13-139		Bass, Right Channel
B	2meg			SR-76	Not Req.	M13-139	■ UE1874	Bass, Left Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R4A	500K		18B642660	B-59	A47-500K-S	Q11-133	U50	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

■ "STA-LOC" equivalent: FA26A, RU26A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	47K	
R6	100K	
R7	10K	
R8	100K	
R9	1800Ω	
R10	100K	
R11	4700Ω	
R12	470K	

ITEM No.	RATING	REMARKS
R13	2.2meg	
R14	82Ω 5W	#17K634893
R15	47K	
R16	100K	
R17	10K	
R18	100K	
R19	1800Ω	
R20	100K	

ITEM No.	RATING	REMARKS
R21	4700Ω	
R22	470K	
R23	2.2meg	
R24	1200Ω 2W	
R25	150Ω 5W	
R26	150Ω 5W	
R27	4.7Ω	Note 1

Note 1. Not used in some versions. Some versions may use 1.8Ω (Part #17K742915).

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .67A	640 VCT @.090A	5V @ 2A	6.3V @ 1.1A			25C642399	22R05U			P-8177①	22R95 U	

① Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω	6-8Ω	25B641660	22S58	A-2902①	AU-609	A-3337①	22S58	S-55X	① Drill New Mounting Holes
T3	5000Ω	6-8Ω	25B641660	22S58	A-2902①	AU-609	A-3337①	22S58	S-55X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	6"	PM	6-8Ω	50K642464①	8A31Z6.7①	① Parallel & Phase
SP2	4"	PM	10-12Ω	50C636446①	4A1TZ10.6①	
SP3	6"	PM	6-8Ω	50K642464①	8A31Z6.7①	
SP4	4"	PM	10-12Ω	50C636446①	4A1TZ10.6①	

PHONO CARTRIDGE

ITEM No.	MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1		13T	Not Req.	66 *	Not Req.			8TA4-S	N-8TA-S

* Use PT-3 Mount.

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MOTOROLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(78 RPM)	* W-101STS † or * W-101STD †♦	E98 † or E98D ♦	† Jewel ♦ Diamond * Includes Cartridge
	(LP)		E98X † or E98XD ♦	

CABINETS & CABINET PARTS

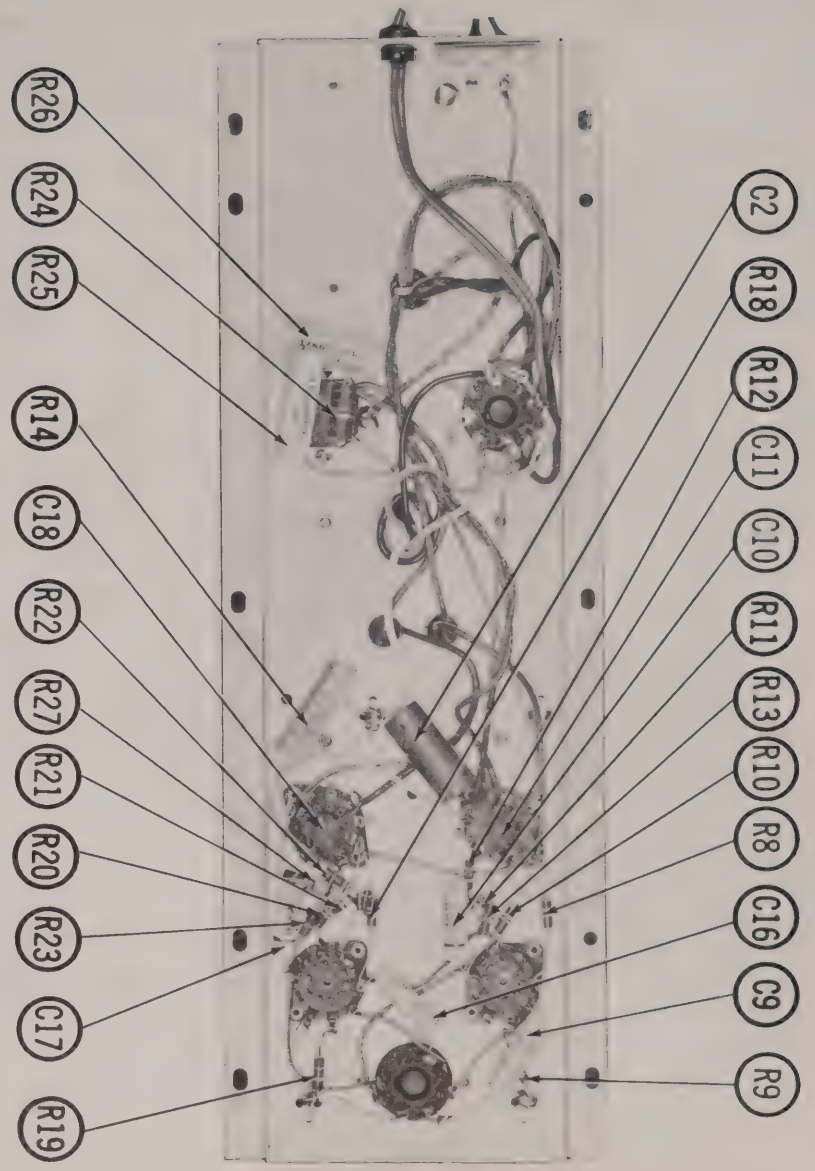
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

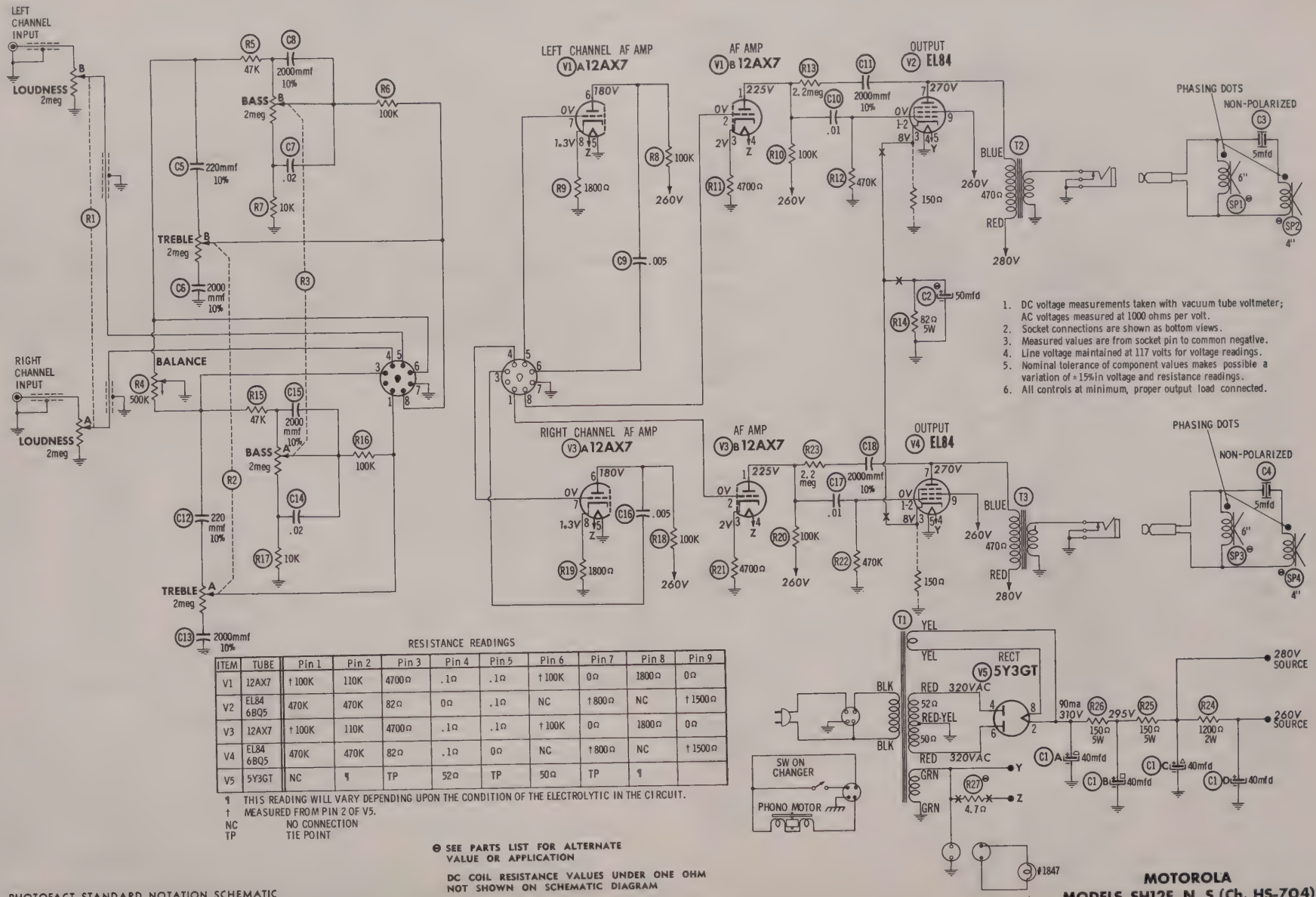
NAME	PART NO.	DESCRIPTION
Knob	36K642652	Loudness
Knob	36K642656	Balance
Knob	36K642654	Bass & Treble
Cabinet	16K643320	Complete, Model SH-12E
Cabinet	16K643325	Less Right & Left Speaker Housings, Model SH-12E
Cabinet	16E643000	Complete, Model SH-12N
Cabinet	16K643215	Less Right & Left Speaker Housings Model SH-12N
Cabinet	16K643321	Complete, Model SH-12S
Cabinet	16K643329	Less Right & Left Speaker Housings, Model SH-12S
Housings	1K643331	Left Speaker, Includes Baffle & Grille, Model SH-12E
Housings	1K643252	Left Speaker, Includes Baffle & Grille, Model SH-12N
Housings	1K643333	Left Speaker, Includes Baffle & Grille, Model SH-12S
Housings	1K643330	Right Speaker, Includes Baffle & Grille, Model SH-12E
Housings	1K643251	Right Speaker, Includes Baffle & Grille, Model SH-12N
Housings	1K643332	Right Speaker, Includes Baffle & Grille, Model SH-12S
Handle	55K643003	Cabinet, Models SH-12E, N
Handle	55K643326	Cabinet, Models SH-12S

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†100K	110K	4700Ω	.1Ω	.1Ω	†100K	0Ω	1800Ω	0Ω
V2	EL84 6BQ5	470K	470K	82Ω	0Ω	.1Ω	NC	†800Ω	NC	†1500Ω
V3	12AX7	†100K	110K	4700Ω	.1Ω	.1Ω	†100K	0Ω	1800Ω	0Ω
V4	EL84 6BQ5	470K	470K	82Ω	.1Ω	0Ω	NC	†800Ω	NC	†1500Ω
V5	5Y3GT	NC	¶	TP	52Ω	TP	50Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V5.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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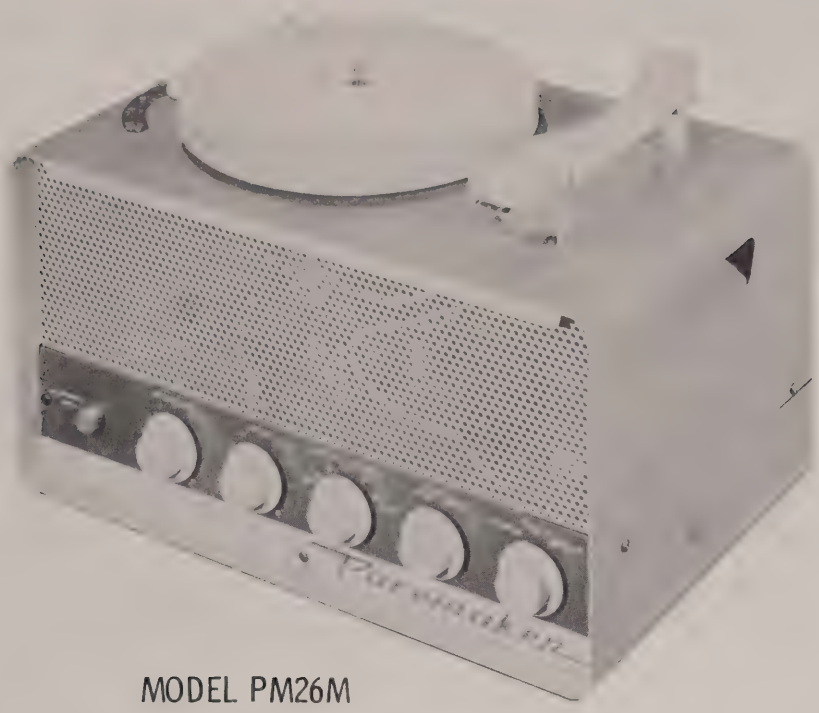
PHOTOFACT® Folder

PACEMAKER
MODELS PM26M, PM26M3

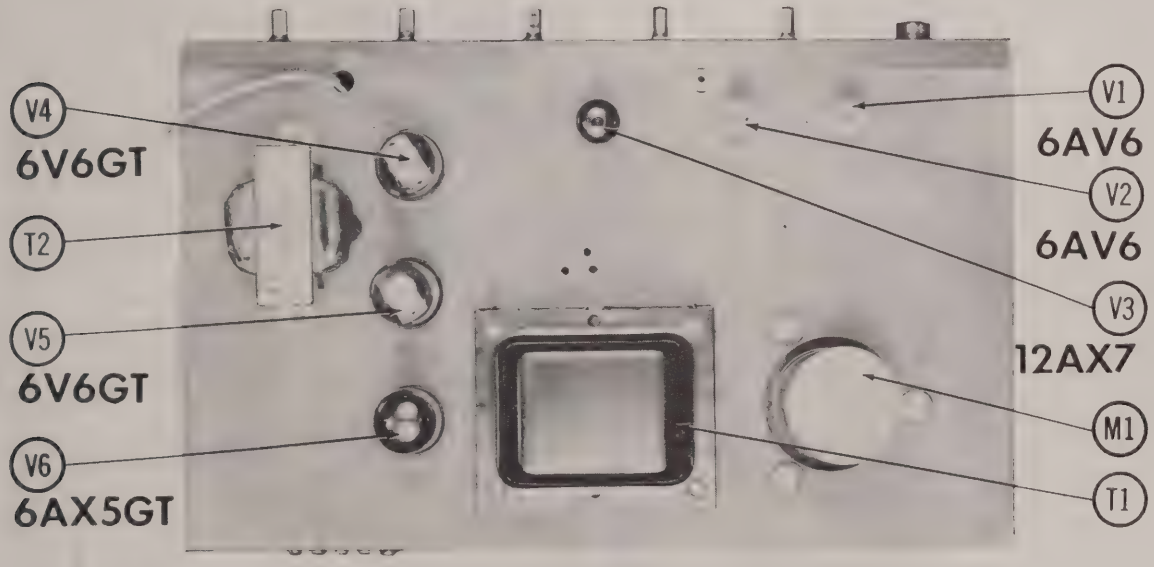
PACEMAKER
MODELS PM26M, PM26M3



MODEL PM26M

PACEMAKER
MODELS PM26M, PM26M3

TRADE NAME	Pacemaker Models PM26M, PM26M3
MANUFACTURER	Bell Sound Div., Thompson Ramo Wooldridge Inc., 555 Marion Road, Columbus, Ohio
TYPE SET	AC-Battery Operated 6 Tube Mobile Audio Amplifier With Manual Record Player
POWER SUPPLY	110-120 Volts AC, 60 Cycles (or) 6 Volt Storage Battery
RATING	77 Watts, .75 Amp. @117 Volts AC (or) 10 Amp. @6.3 Volts DC



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JX456

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •		GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE		
V1	Mic Preamplifier	6AV6	V4	Output	6V6GT		
V2	AF Amplifier	6AV6	V5	Output	6V6GT		
V3	AF Amp. -Phase Inv.	12AX7	V6	Rectifier	6AX5GT		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PACEMAKER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	20	450	B-20053P154	PR3-055	BBRQ0500	TCD75	TDLD-28	TVAS-3727 *	
B	10	450				TC3501	TD-100-50	TVA-1310	
C	100	50							
C2A	10	450	B-20053P152	PRS2360	BBRD1145	TCD72	TDLD-26	TVA-2722	
B	10	450							
C3	150	15	B-20053P14	PRS1370	BR1505	TC25015	TD-150-50	TVA-1311	Note 1
C4	4	236AC	B-20052P33	RY-666	KGN-2040	OP-436		OR-2040	

Note 1. Alternate Part #B-20053P155.

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

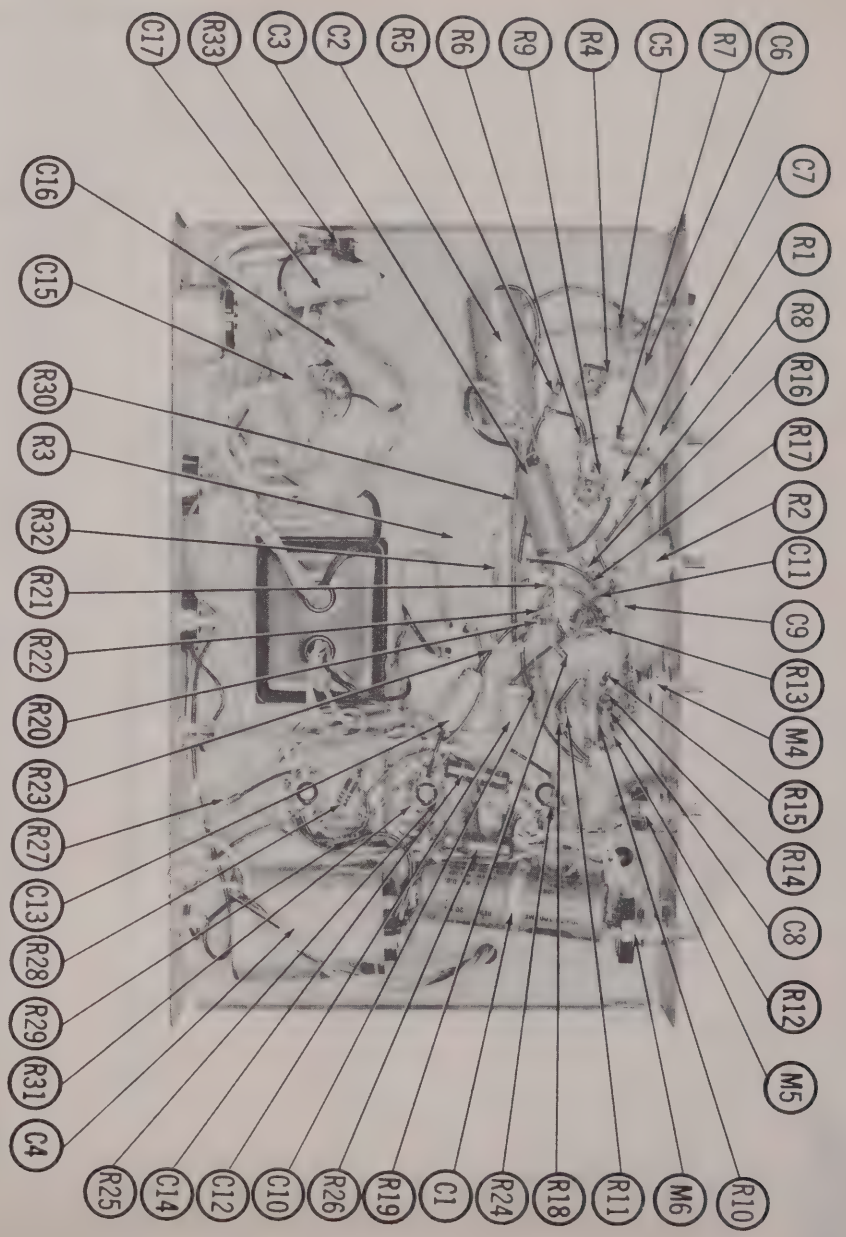
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C8	.005 400V 10%		V84C4D47 10%		PM6D5	6DP-1-502	GTM-4247	6TM-D5
C9	470 10%		1468-00047K	D6-471	22R5T47	CM-20B-471K	MCB245	MS-347
C10	.003 400V 10%		V84C4D3 10%		PM6D3	6DP-1-302	GTM-4233	6TM-D3
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C13	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C14	.001 1600V 10%					16DP-1-102	GEM-1621	
C15	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C16	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C17	.5 200V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PACEMAKER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	1/2	B20066P140	B-70	A47-1meg-Z	Q13-137	U53	Mic. Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	1/2	B20066P140	B-70	A47-1meg-Z	Q13-137	U53	Phono Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	100Ω	2(WW)	B20066P141	WN-101	A43-100	WPK100	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	4.7meg	
R5	100K	
R6	270K	
R7	270K	
R8	270K	
R9	3300Ω	
R10	47K	
R11	470K	
R12	47K	
R13	1meg	

ITEM No.	RATING	REMARKS
R14	150K	
R15	68K	
R16	270K	
R17	470K	
R18	2200Ω	
R19	6800Ω 5%	
R20	1meg	
R21	220K	
R22	3300Ω	
R23	220K	

ITEM No.	RATING	REMARKS
R24	270K	
R25	270K	
R26	250Ω 4W	
R27	300K	(1meg) *
R28	1500Ω 1W	Note 1
R29	1500Ω 1W	Note 1
R30	47K	
R31	470K	
R32	47K	
R33	20Ω 1W	

* Alternate.
Note 1. A single 2700Ω 2W may be used to replace R28 & R29.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	AC OPERATION			PACEMAKER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	117V@ .75A	880 VCT @.090A	9.5 VCT Not Used Tap@ 6.3V @ 3.4A	B-20294						
	DC OPERATION									
	PRI.		SEC. 1							
	10 VCT Tap@ @5.5A 6V Not Used		700 VCT @.065A							
	SEC. 2	SEC. 4	SEC. 5							
	117 VAC									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PACEMAKER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5700Ω CT	250Ω (70V) Tap@ 16Ω, 8Ω, 4Ω	B20295		A-3028					

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				PACEMAKER PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6V	60~		3485		3485	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	PACEMAKER PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	B-20237P5 ①	51-3M	G-78-J *	53-3	PFT-3			1P-3S	
	B-20237P6 ②	55TM	GD-J *	56	PT-2			2P-S	

① Single Speed Includes Arm.
② Three Speed Includes Arm.
* LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PACEMAKER PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	3 Speed	† W-75TPS or †♦ W-75DS or ♦ W-75TPD	† A-71 or †♦ A-71SD or ♦ A-71D	† Jewel ♦ Diamond
	1 Speed	† W-3S or ♦ W-3D	† A-74 or ♦ A-74D	

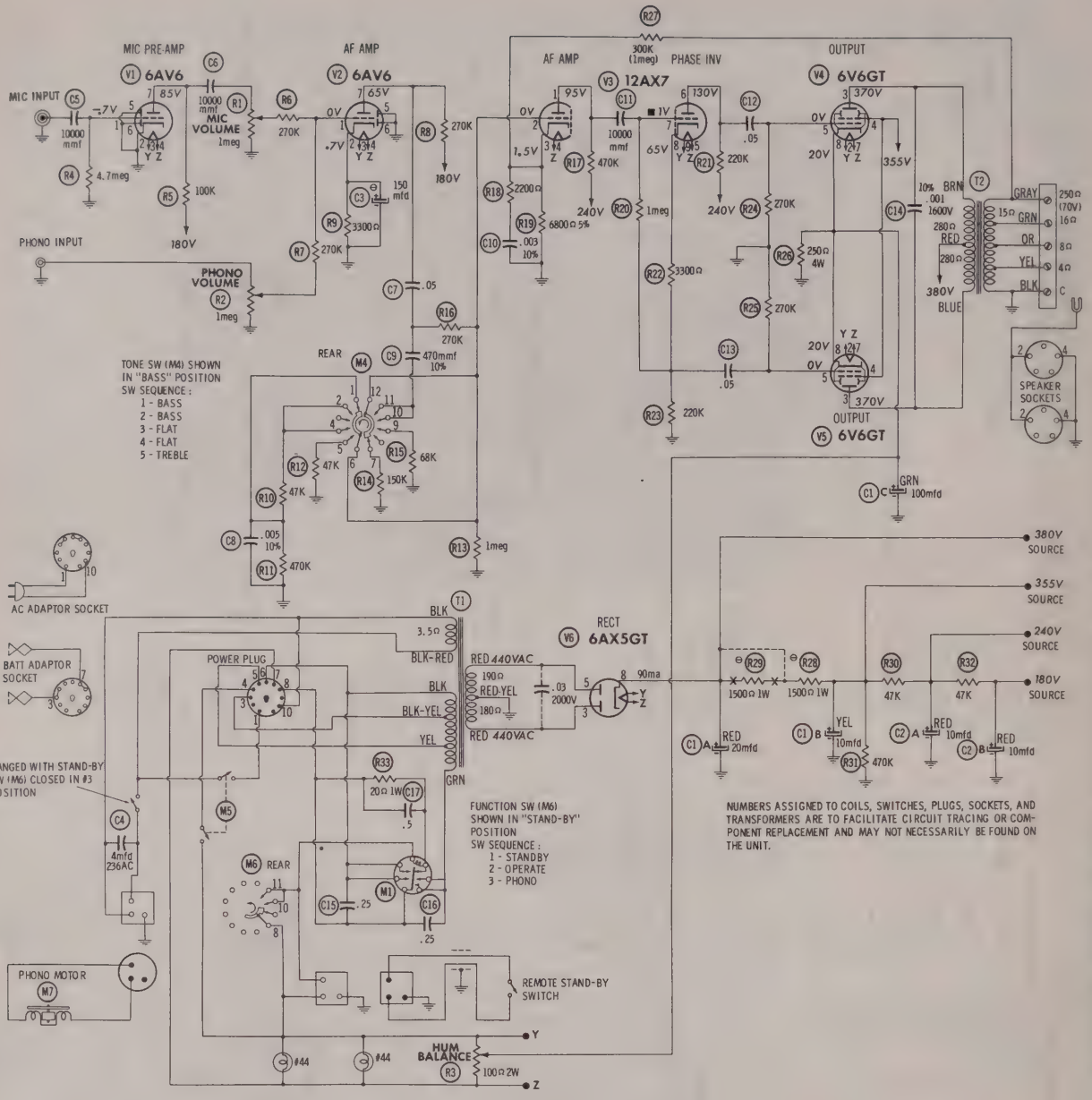
MISCELLANEOUS

ITEM No.	PART NAME	PACEMAKER PART No.	NOTES
M4	Switch	B-20033P8	Tone (Rotary Type)
M5	Switch	B-20D5P19	Off-On
M6	Switch	B-20033P9	Function (Standby-Operate-Phono) (Rotary Wafer With AC Switch)
M7	Motor	B-20239P4	Phono (Single Speed)
	Motor	B-20239P3	Phono (Three Speed)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob Handle	B-20148P52 13A0132	Microphone, Phono, Tone, Off-On, Function



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	4.7meg	0Ω	300Ω	300Ω	0Ω	0Ω	†195K		
V2	6AV6	140K	3300Ω	300Ω	300Ω	0Ω	0Ω	†365K		
V3	12AV7	†520K	100K	6800Ω	300Ω	300Ω	†270K	1.2meg	220K	300Ω
V4	6V6GT	TP	300Ω	†280Ω	†3000Ω	270K	NC	300Ω	250Ω	
V5	6V6GT	TP	300Ω	†280Ω	†3000Ω	270K	TP	300Ω	250Ω	
V6	6AX5GT	TP	300Ω	160Ω	TP	190Ω	NC	300Ω	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V6.
▪ MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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PACEMAKER
MODELS PM26M, PM26M3

PHOTOFACT® Folder

PHILCO
MODELS G-1412, G-1608

PHILCO
MODELS G-1412, G-1608

MODEL G-1412

PHILCO
MODELS G-1412, G-1608

TRADE NAME	Philco Models G-1412, G-1608
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	AC Operated 5 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 36 Watts, .37 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER M-41S — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT439

DATE 1-60 SET 469 FOLDER 12

SET 469 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	Left Channel AF Amp.	6AU6
V2	Left Channel Output	6AQ5
V3	Right Channel AF Amp.	6AU6
V4	Right Channel Output	6AQ5
V5	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	400	30-2590-47	AFH3-30-35	B0390	FP231.3	TMD-49	TVL-2754	
B	▲20	400			BR4045	TC78	TD-40-450	TVA-1712	
C	10	400							
C2	10	25	30-2417-49	SRE25V10	NLW10-25	TC22	ML10-25	TVA-1204	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.0022 600V		P688N-0022	DD-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C4	.0033 600V		P688N-0033	DD-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C5	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C6	.22 100V		P288N-22		CUB2P22	1DP-3-224	GEM-2022	2TM-P22
C7	.0022 600V		P688N-0022	DD-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C8	.0022 600V		P688N-0022	DD-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C9	.0033 600V		P688N-0033	DD-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C10	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C11	.22 100V		P288N-22		CUB2P22	1DP-3-224	GEM-2022	2TM-P22
C12	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C13	.0022 600V		P688N-0022	DD-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C14	2.0 100V	Note 1	P282Z-2		WMF1W2E			118P20502S2

Note 1. Not used in Model G-1608.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg *	½	33-5573-49					Loudness, Right Channel
B	2meg *	½						Loudness, Left Channel
R2A	1meg	½	33-5573-48	B-70	AD47-1meg-Z	Q13-137		Treble, Right Channel ①
B	1meg	½		SR-70	Not Req.	M13-137	■ UE3913	Treble, Left Channel ①
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	1meg	½	33-5587-34	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	500K	½	33-5573-50	B-60	AD47-500K-Z	Q13-133		Bass, Right Channel ②
B	500K	½		SR-60	Not Req.	M13-133	▲ UE1398	Bass, Left Channel ②
C	Shaft			Not Req.	FS-3	Not Req.		

* Tap at 1meg.
■ "STA-LOC" equivalent: FA16A, RU16A, CS3500.
▲ "STA-LOC" equivalent: FA55A, RU55A, CS3500.
① Some versions may use 500K dual in this application (Part #33-5573-50).
② Some versions may use 1meg dual in this application (Part #33-5573-48).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

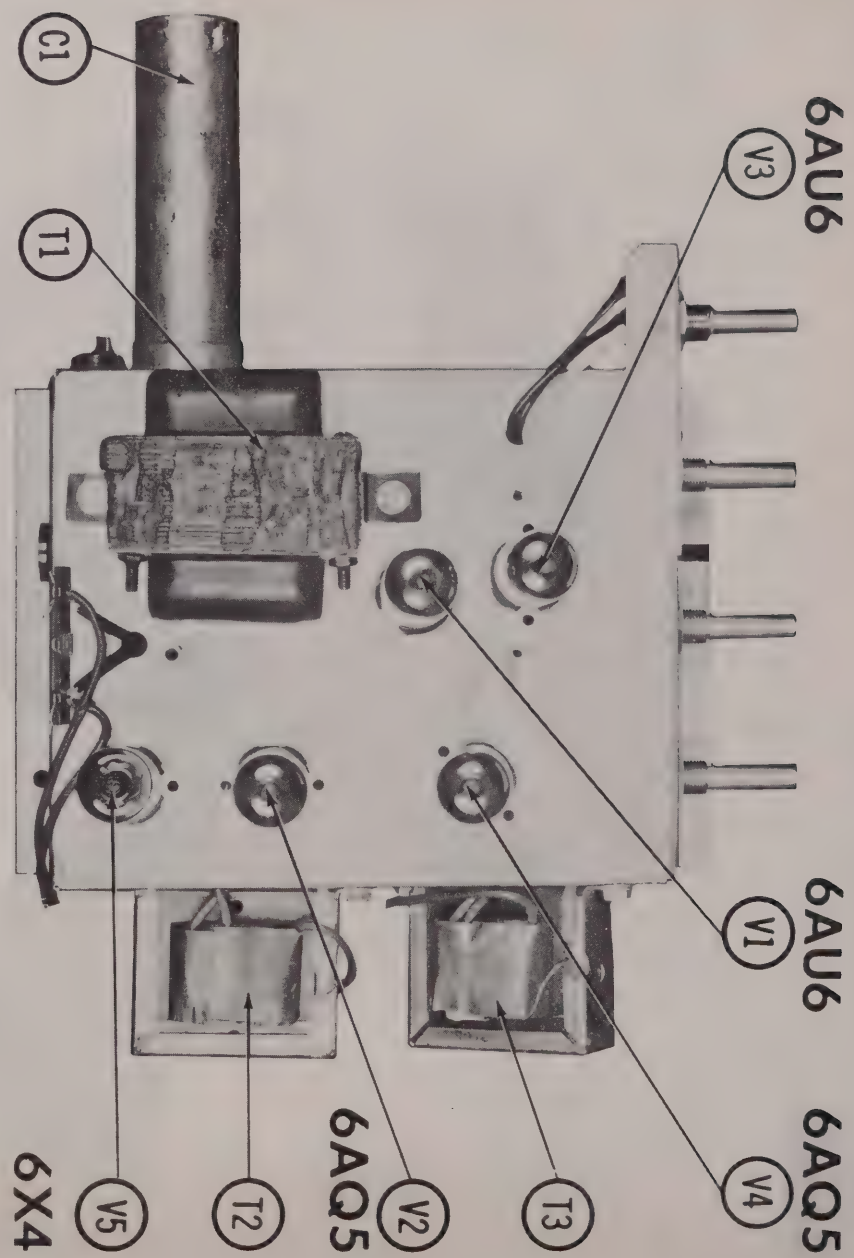
ITEM No.	RATING	REMARKS
R5	1meg	Note 1
R6	33K	
R7	82K	
R8	100Ω	
R9	2700Ω	
R10	100K	
R11	470K	
R12	56K	

ITEM No.	RATING	REMARKS
R13	270Ω	
R14	33K	
R15	82K	
R16	100Ω	
R17	2700Ω	
R18	100K	
R19	150K	
R20	1000Ω	

ITEM No.	RATING	REMARKS
R21	470K	
R22	56K	
R23	270Ω	
R24	5600Ω	
R25	18K 2W	
R26	56Ω	
R27	56Ω	

Note 1. Not used in Model G-1608.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .37A	550 VCT @.040A	6.3V@ 2.2A	32-8887-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	6-8Ω	32-8886-1	24S64	A-2901	AU-604	A-3849	24S64	S-53X	
T3	5200Ω	6-8Ω	32-8886-1	24S64	A-2901	AU-604	A-3849	24S64	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	5"x 7"	PM	6-8Ω	36-1649-8 ①	57A1Z7.9	① Model G-1412
SP2	5"	PM	6-8Ω	36-1669-13①	5A1Z7.6	② 2 Used Model G-1608
SP3	4"	PM	14-16Ω	36-1673-5①	4A1Z15	③ Includes Choke
SP4	4"	PM	14-16Ω	36-1673-5①	4A1Z15	
	8"	PM		36-1651-25②③		
	4"	PM		36-1673-4②		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	PHILCO PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	325-8039	13T	Not Req.	* 66	Not Req			8TA4-S	N-8TA-S

* Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHILCO PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(78 RPM)	* W-101STS † or * W-1D1STD ♦ or * W-102S †	E98 † or E98D ♦	† Jewel ♦ Diamond * Includes Cartridge
	(LP)		E98X ♦ or E98XD ♦	

CABINETS & CABINET PARTS

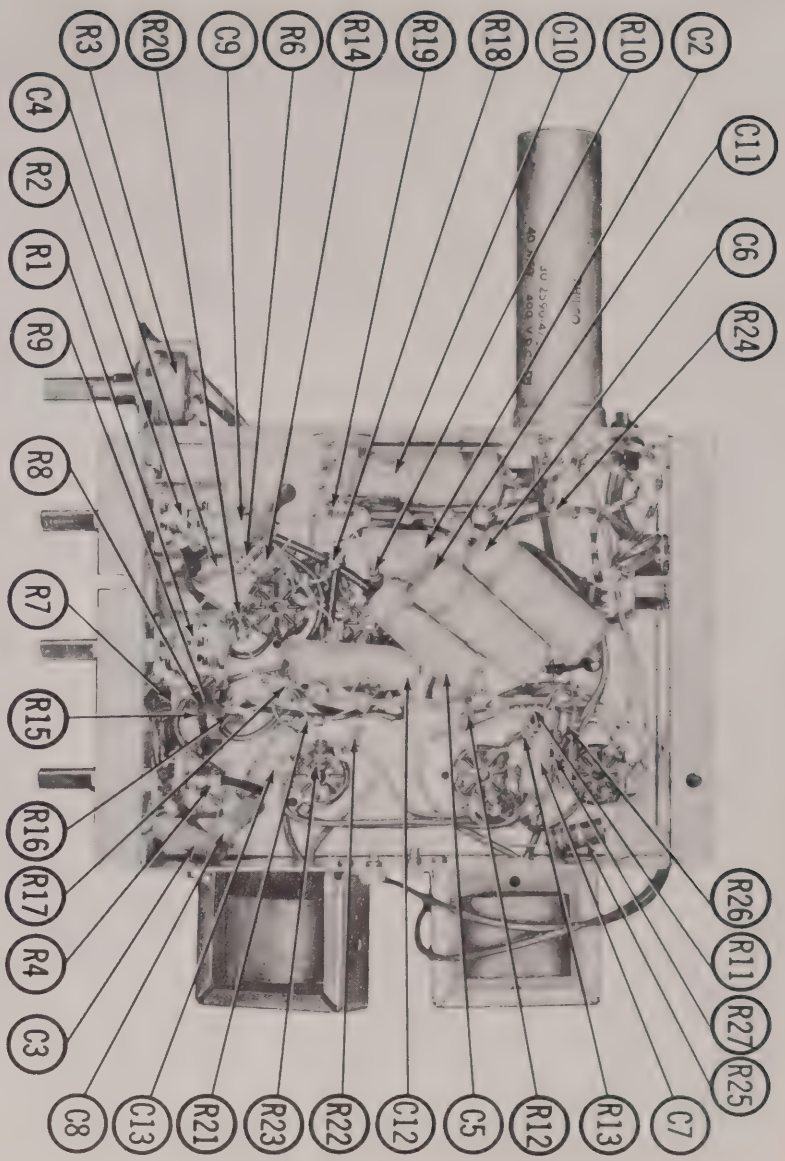
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

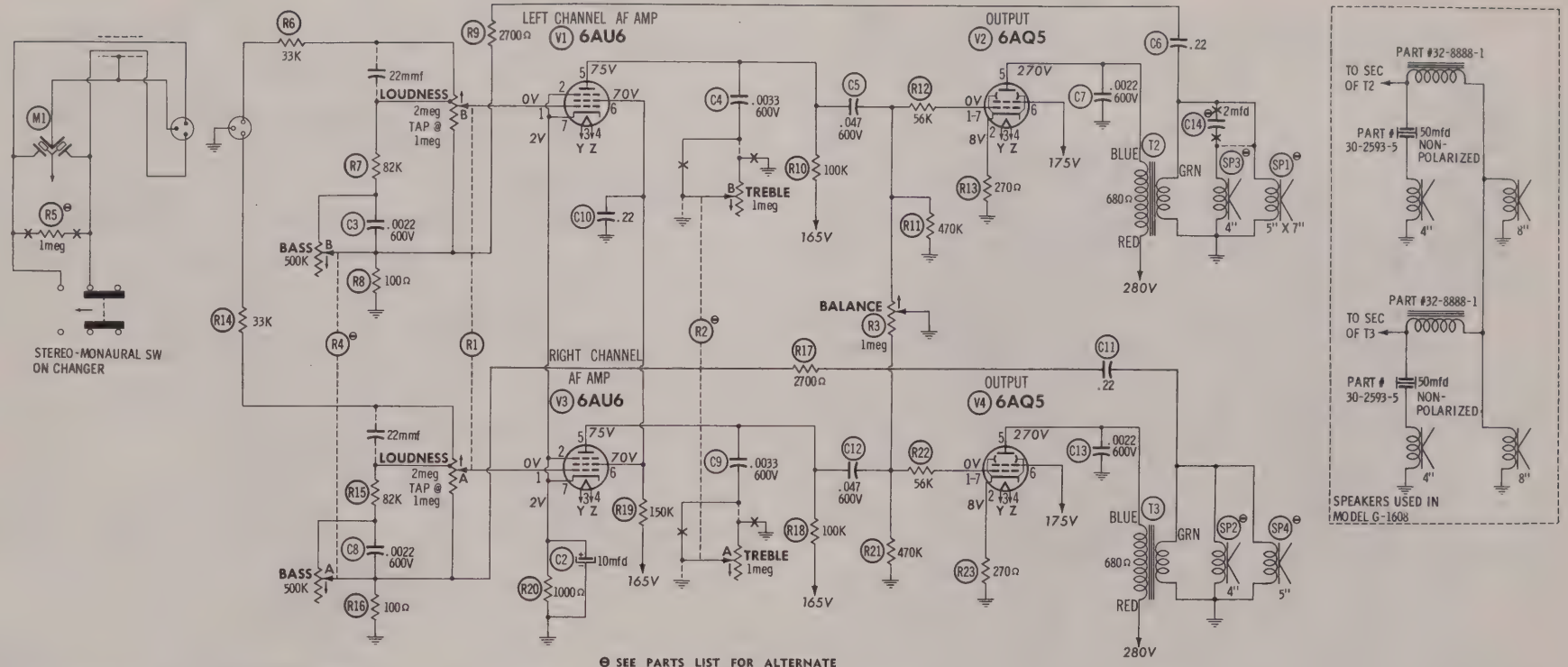
NAME	PART NO.	DESCRIPTION
Bezel	28-12791	
Knob	56-6421-4	Bass, Loudness, Treble, Balance, Model G-1412
Knob	56-6421-1	Bass, Loudness, Treble, Balance, Model G-1608
Knob	28-12829	Remote Speaker Unit, 2 Used, Model G-1412

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6AU6	100Ω	1000Ω	28Ω	28Ω	†120K	†170K	1000Ω
V2	6AQ5	250K	270Ω	28Ω	28Ω	†680Ω	†18K	250K
V3	6AU6	100Ω	1000Ω	28Ω	28Ω	†120K	†160K	1000Ω
V4	6AQ5	NC	270Ω	28Ω	28Ω	†680Ω	†18K	250K
V5	6X4	200Ω	NC	28Ω	28Ω	NC	200Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHILCO
MODELS G-1412, G-1608

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PHONOLA MODEL 2758

PHONOLA MODEL 2758

PHONOLA MODEL 2758

TRADE NAME	Phonola Model 2758
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minnesota
TYPE SET	AC Operated 5 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 38 Watts, .4 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13230 — SEE V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT479

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp.	6AU6A
V2	Left Channel Output	6AQ5A
V3	Right Channel AF Amp.	6AU6A
V4	Right Channel Output	6AQ5A
V5	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	350	13235	AFH4-50	D0420		TMQ-55	TVL-4620.5	
B	■15	350							
C	▲25	25							
D	25	25							
C2	4	10VNP	12961	NP-PRS7405	BBR8-150 †	TCN504			
C3	4	10VNP	12961	NP-PRS7405	BBR8-150 †	TCN504			

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C4	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C7	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg	½	13229	B-88	AD47-5meg-S			Loudness, Right Channel
B	5meg	½		SR-88	Not Req.		■ UE3967	Loudness, Left Channel
C	Shaft			Not Req.	KSS-3			
R2A	5meg	½	13229	B-88	AD47-5meg-S			Bass, Right Channel
B	5meg	½		SR-88	Not Req.		■ UE3967	Bass, Left Channel
C	Shaft			Not Req.	KSS-3			
R3A	2meg	½	13228	B-76	AD47-2meg-Z	Q13-139		Treble, Right Channel
B	2meg	½		SR-76	Not Req.	M13-139	▲ UE1877	Treble, Left Channel
C	Shaft			Not Req.	KSS-3	Not Req.		
R4	1500Ω	1(WW)	13239		39-1500	U12-1500	FL-1.5K	Balance, Left Channel
R5	1500Ω	1(WW)	13239		39-1500	U12-1500	FL-1.5K	Balance, Right Channel

■ "STA-LOC" equivalent: FA56A, RU56A, CS3500.
▲ "STA-LOC" equivalent: FA26A, RU26A, CS3500.

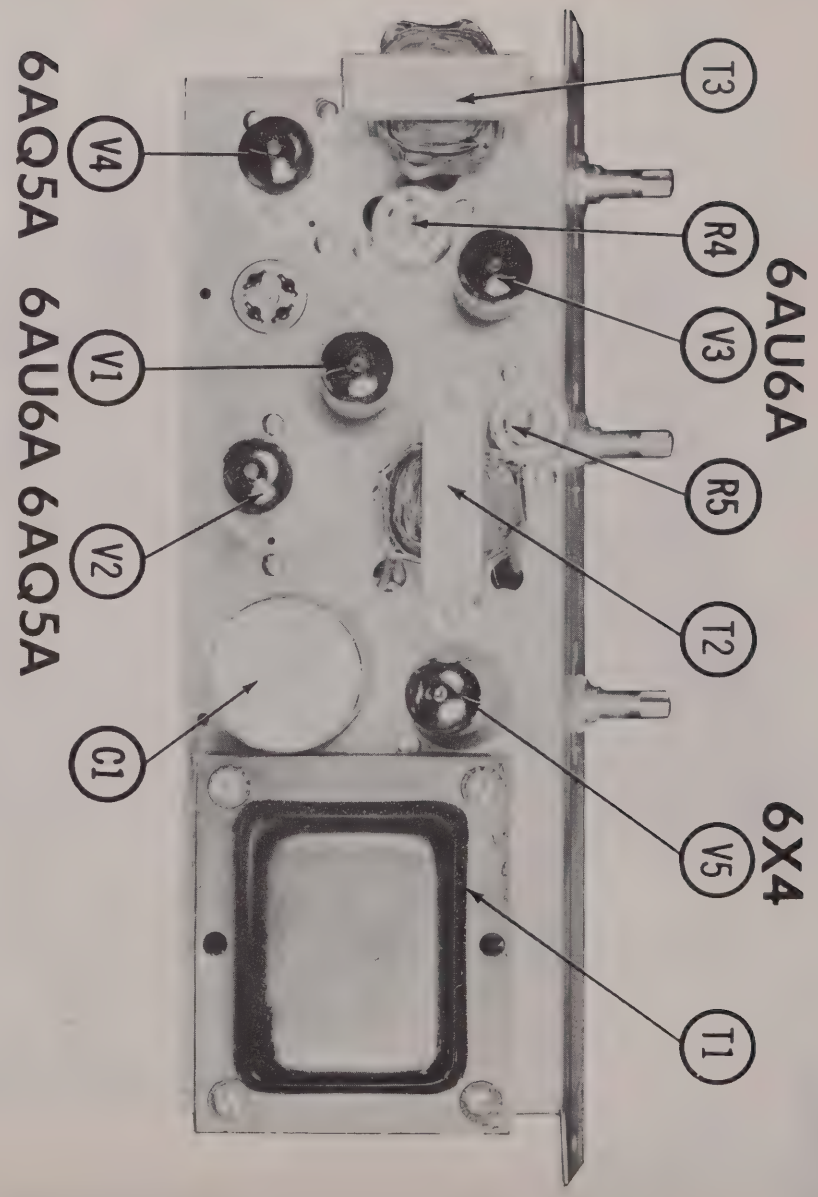
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	270K	
R7	10meg	
R8	270K	
R9	560Ω	
R10	39K	
R11	470K	
R12	330Ω 1W	
R13	270K	
R14	10meg	
R15	270K	
R16	27K	
R17	100K	
R18	560Ω	
R19	39K	
R20	470K	
R21	330Ω 1W	
R22	100Ω 1W	
R23	220Ω 2W	Note 1
R24	10K 1W	(4700Ω)*
R25	2.2meg	Note 1

Note 1. Not used in some versions. * Alternate Value.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .40A	560 VCT @ .050A	6.3 VCT @ 2.1A	13341	24R21				24R21	R-9B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	13342	24S51	A-2930	AU-601	A-3877	24S51	S-3X	
T3	5200Ω	3-4Ω	13342	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHONOLA PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω	12712	46A07	
SP2	6"	PM	3-4Ω	12963	6A21	
SP3	4"x 6"	PM	3-4Ω	12712	46A07	
SP4	6"	PM	3-4Ω	12963	6A21	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	PHONOLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	13376 (Includes Needles)	*13TB	Not Req.			‡ 66	Not Req.	* 8TA4-S	N-8TA-S

* Includes Mounting.
‡ Use Mount PT-3

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	13377	W-101STSS † or W-101STDS ♦	S-69X † or S-69XSD †♦ or S-69XDD ♦	† Jewel ♦ Diamond

CABINETS & CABINET PARTS

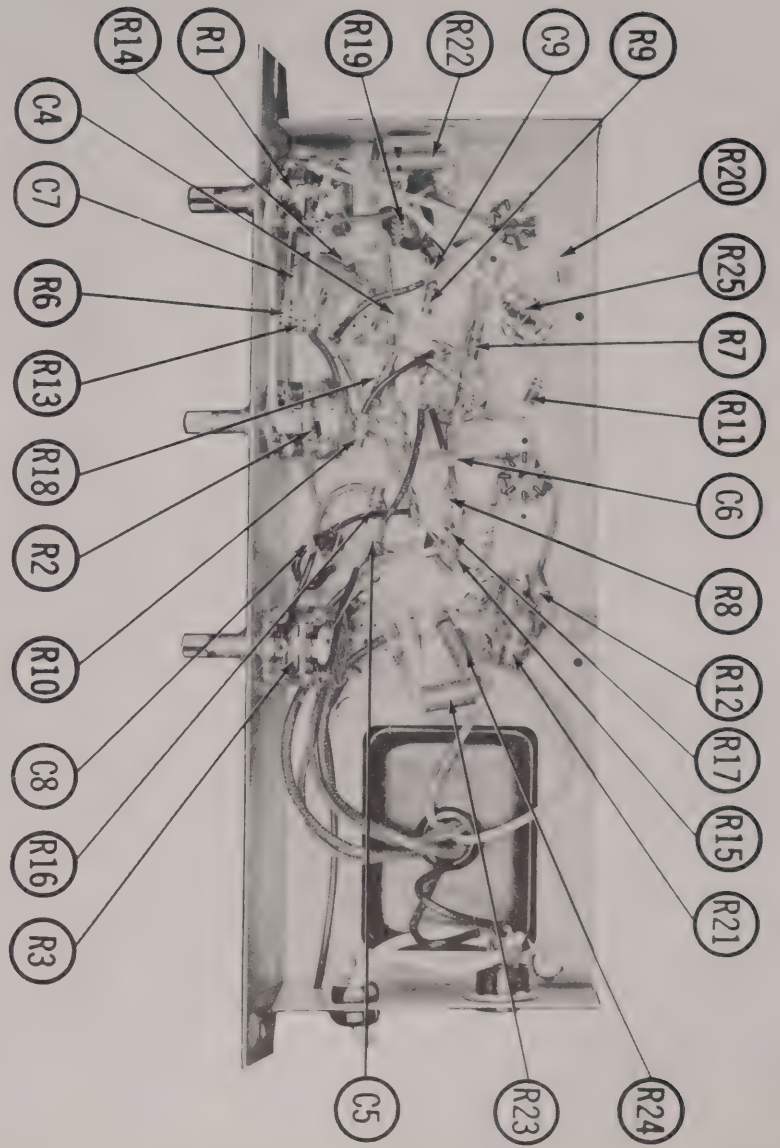
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	13440-8E	Volume, Tone, Balance
Case Assembly	13320	
Handle	12956-6B	
45 RPM Spindle	11019	

WIRING DATA

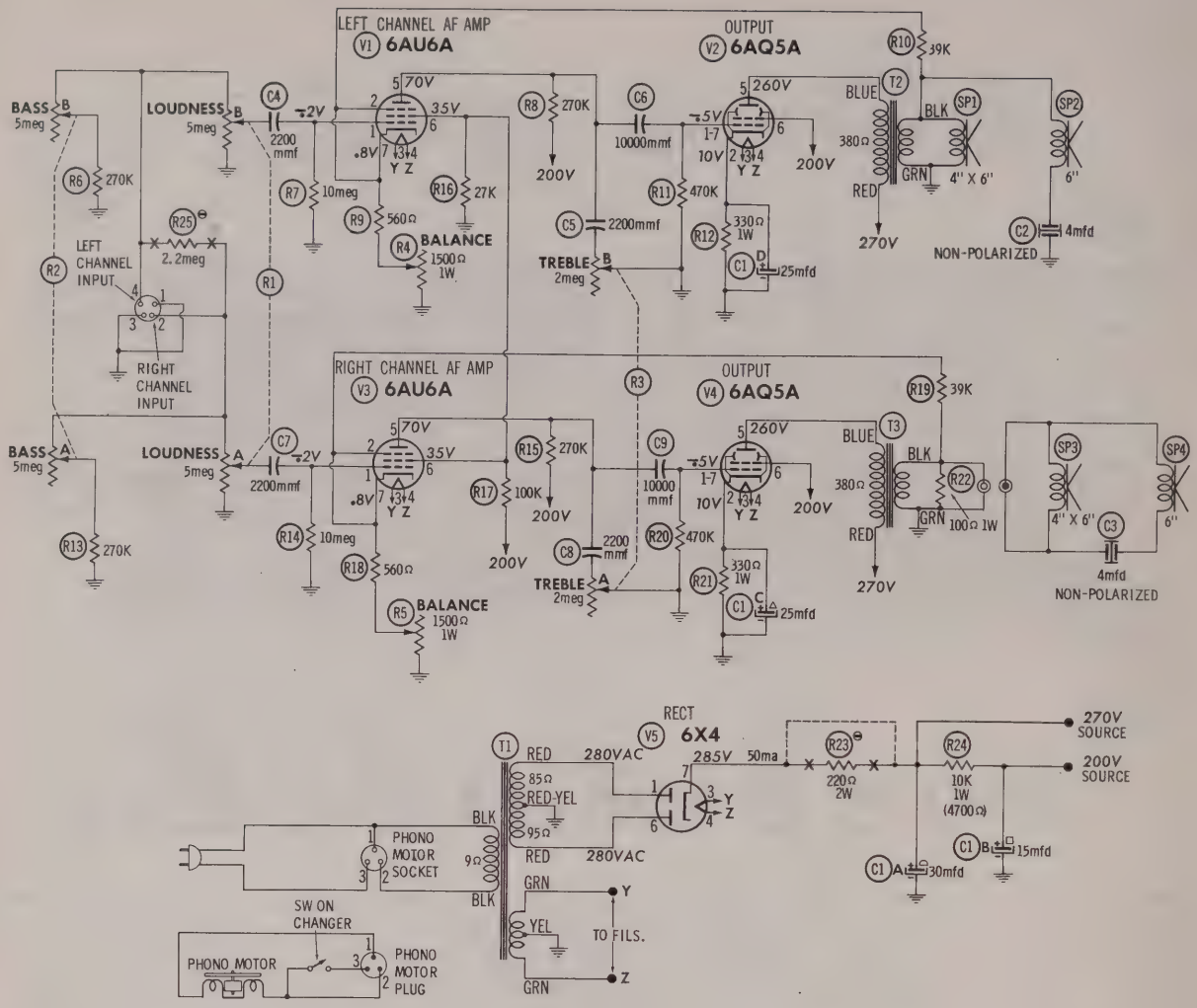
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW



PHONOLA
MODEL 2758

FOLDER 13



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6AU6A	10meg	1100Ω *	.1Ω	.1Ω	†280K	†110K	1100Ω *
V2	6AQ5A	470K	330Ω	.1Ω	.1Ω	†600Ω	†10K	470K
V3	6AU6A	10meg	1100Ω *	.1Ω	.1Ω	†280K	†110K	1100Ω *
V4	6AQ5A	470K	330Ω	.1Ω	.1Ω	†600Ω	†10K	470K
V5	6X4	85Ω	NC	.1Ω	.1Ω	NC	95Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHONOLA MODEL 2758

PHOTOFACT® Folder

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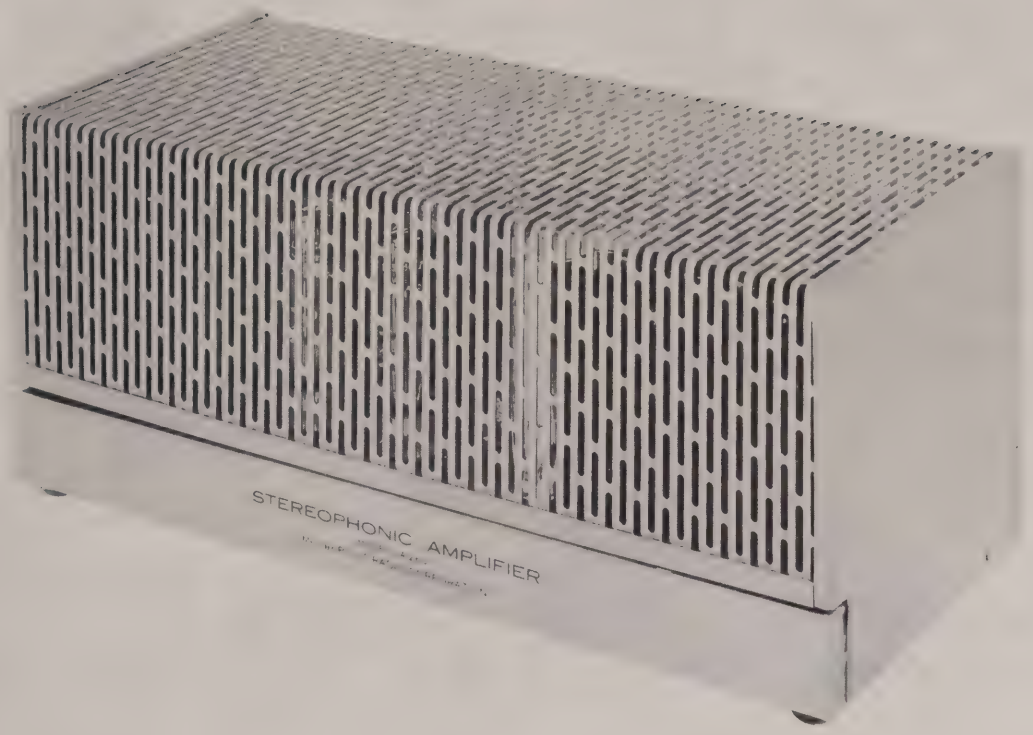
PILOT
MODEL SA-260

PILOT
MODEL SA-260



PILOT
MODEL SA-260

TRADE NAME	Pilot Model SA-260
MANUFACTURER	Pilot Radio Corp., 37-06 36th Street, Long Island City 1, N. Y.
TYPE SET	AC Operated 9 Tube Stereo Amplifier
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 190 Watts, 1.8 Amp. @ 117 Volts AC

ADJUSTMENTS

BIAS AND BALANCE ADJUSTMENTS

Locate test points A1, A2 (Channel 1) and B1, B2 (Channel 2) on top of chassis.

Channel 1

1. Connect a DC voltmeter from A1 to chassis. Adjust R1 for meter reading of 1 volt.
2. Connect a DC voltmeter from A1 to A2. Adjust R2 for zero volts.
3. Repeat steps 1 and 2.

Channel 2

1. Connect a DC voltmeter from B1 to chassis. Adjust R3 for meter reading of 1volt.
2. Connect a DC voltmeter from B1 to B2. Adjust R4 for zero volts.
3. Repeat steps 1 and 2.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JV470

SET 469 FOLDER 14

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel A AF Amplifier - Channel B AF Amplifier	12AU7A
V2	Channel A AF Amplifier - Channel A Phase Inverter	ECC83/12AX7
V3	Channel A Output	EL34/6CA7
V4	Channel A Output	EL34/6CA7
V5	Channel B AF Amplifier - Channel B Phase Inverter	ECC83/12AX7
V6	Channel B Output	EL34/6CA7
V7	Channel B Output	EL34/6CA7
V8	Rectifier	5U4GB
V9	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	475	24-107	AFH2-66-50	B0489	FP264.5	TMD-93	TVL-2850	
B	▲80	475							
C2A	■20	450	24-167	AFH3-30-35	A0480	FP146	TMS-57	TVL-1725	
B	▲40	450			BR2045	TC75	TD-20-450	TVA-1709	
C3	10	100	24-143	PRS1410	BBR10-150	TC42	TD-10-150	TVA-1406	
C4	50	100	24-168	PRS1480	BR5015	TC49	TD-50-150	TVA-1414	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	100 N150 10%					*		10TCP-T10
C6	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C7	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C8	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C9	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C10	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C11	500 10%		DI-500	DD-501	PM6T5	CCS-501	MCB245	10TS-T50
C12	100 N150 10%					*		10TCP-T10
C13	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C14	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C16	.1 600V		P688N-1	DF-104	CUB6P1	6DP-1-104	GEM-601	6TM-P1
C17	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C18	500 10%		DI-500	DD-501	PM6S5	CCS-501	MCB245	10TS-T50
C19	.047 400V		P488N-047	DF-503	PM6S5	4DP-3-473	GEM-4147	4TM-S47

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	PILOT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	50K	½	39-60	BX-31	B47-50K-S	B11-123	PTA54L	Bias, Channel A
B	Shaft			Not Req.	Not Req.	TM1	Not Req.	
R2A	1meg	½	39-43	BX-69	B47-1meg-S	B11-137	TA16L	Balance, Channel A
B	Shaft			Not Req.	Not Req.	TM1	Not Req.	
R3A	50K	½	39-60	BX-31	B47-50K-S	B11-123	PTA54L	Bias, Channel B
B	Shaft			Not Req.	Not Req.	TM1	Not Req.	
R4A	1meg	½	39-43	BX-69	B47-1meg-S	B11-137	TA16L	Balance, Channel B
B	Shaft			Not Req.	Not Req.	TM1	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	22K	
R6	1meg	
R7	68K 1W	
R8	10K	
R9	1meg	
R10	68K 1W	
R11	820Ω	
R12	1meg	
R13	68K 1W	
R14	680Ω	
R15	12K 5%	
R16	330K 5%	
R17	470K	
R18	1000Ω	
R19	20Ω 5%	Note 1
R20	330K	
R21	470K	
R22	1000Ω	
R23	20Ω 5%	Note 1
R24	5600Ω	
R25	22K	
R26	1meg	
R27	68K 1W	
R28	10K	
R29	1meg	
R30	68K 1W	
R31	820Ω	
R32	1meg	
R33	68K 1W	
R34	680Ω	
R35	12K 5%	
R36	330K 5%	
R37	470K	
R38	1000Ω	
R39	20Ω 5%	Note 2
R40	330K	
R41	470K	
R42	1000Ω	
R43	20Ω 5%	Note 2
R44	5600Ω	
R45	27K	
R46	15K 2W	
R47	15K 2W	
R48	33Ω 10W	
R49	39K	
R50	68K	
R51	330K	
R52	27K	
R53	15K 2W	
R54	15K 2W	

Note 1. R19 & R23 matched within 1%.

Note 2. R39 & R43 matched within 1%.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.8A	860VCT @ .200A Tap @ 115VCT @ .005A	5V @ 6A	55-64						
	SEC. 3		SEC. 4							
	23VCT Not used		6.3VCT @ 6.9A							

TRANSFORMER (AUDIO OUTPUT)

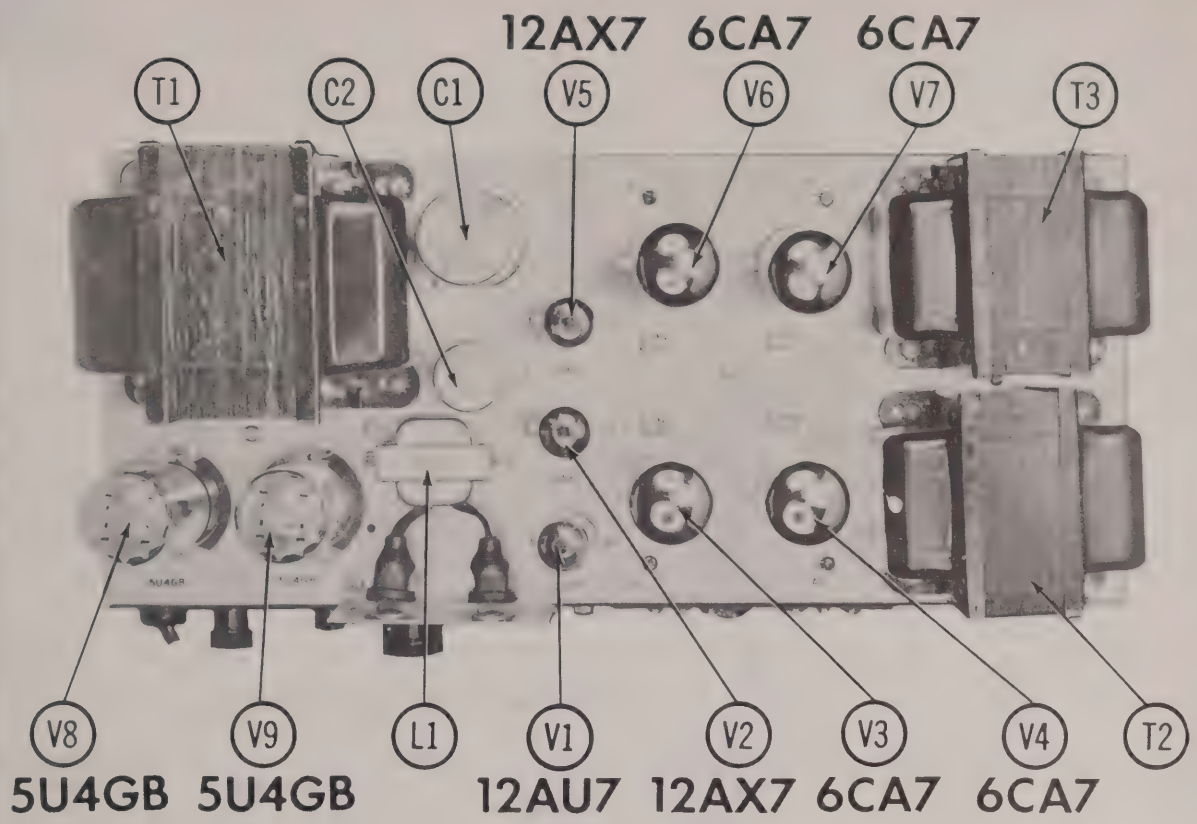
ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5500Ω CT Screen Taps @ 500Ω CT	16Ω Tap @ 8Ω	56-57							
T3	5500Ω CT Screen Taps @ 500Ω CT	16Ω Tap @ 8Ω	56-57							

RECTIFIERS

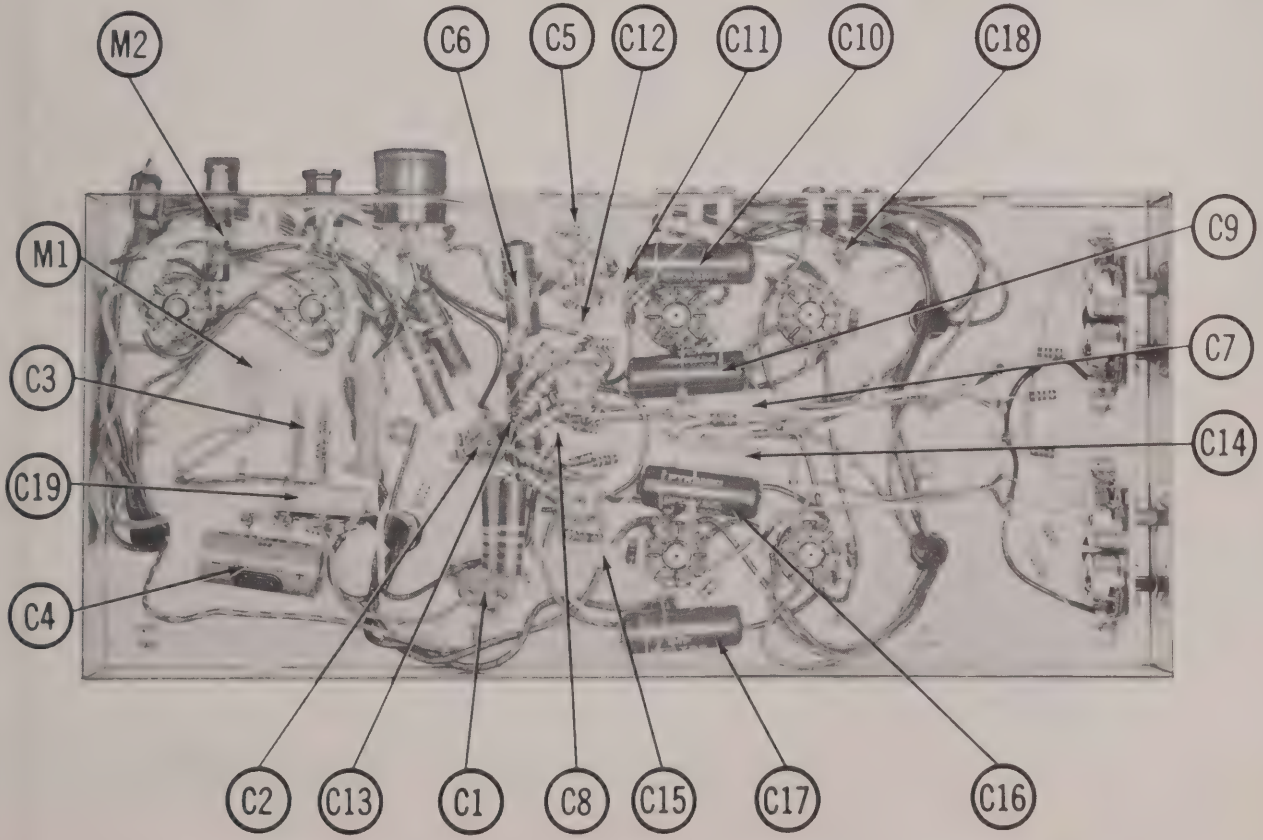
ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA PILOT PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.005A	110-575 ①	CP20 ① ②	D-5410 ① ②	10 ① ②		① Selenium Type ② Two required

FUSES

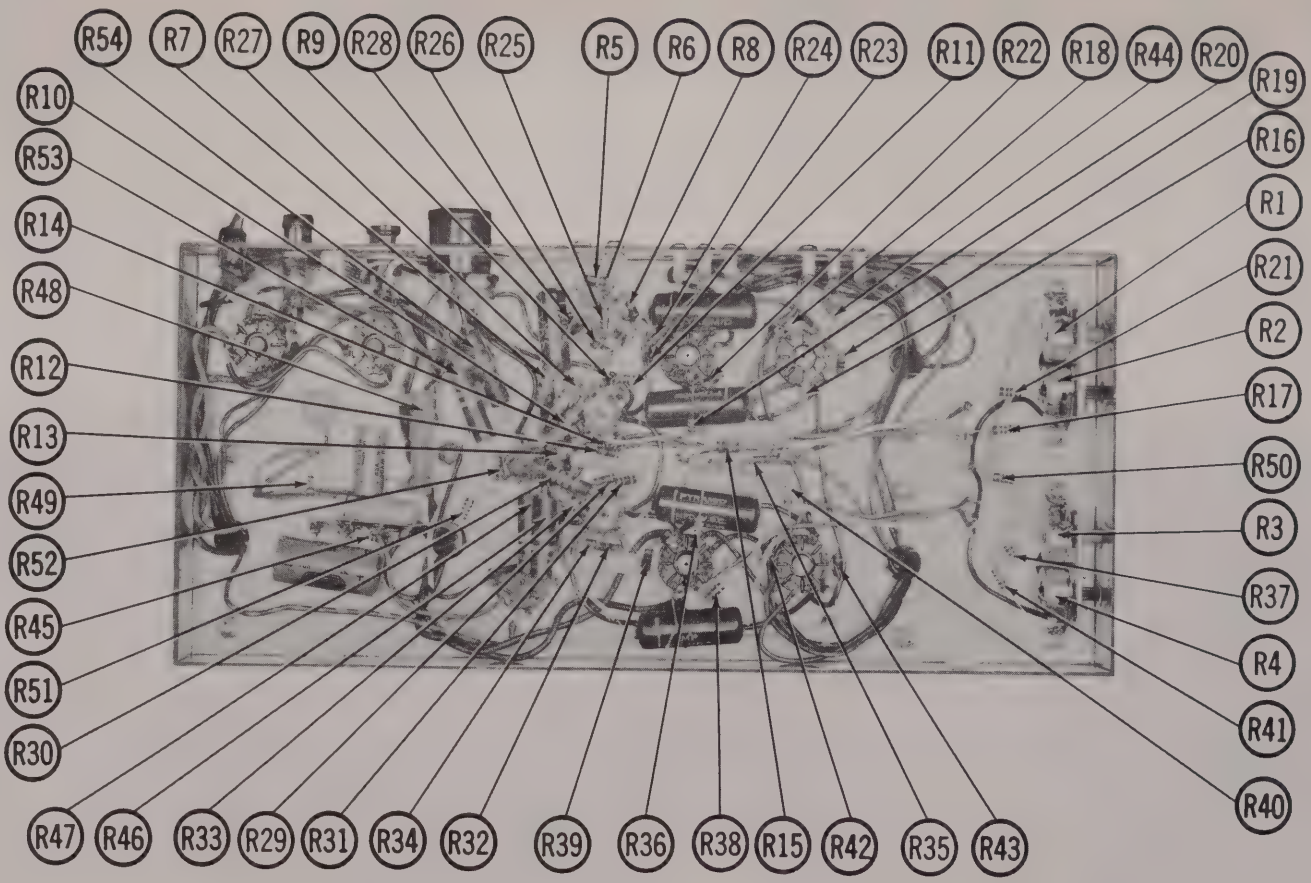
ITEM No.	TYPE	RATING	PILOT PART No. FUSE	PILOT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	2½A 125V S/B	111-12		31302.5 (3AG 2½ 125V S/B)	342001	MDL 2½	HKP



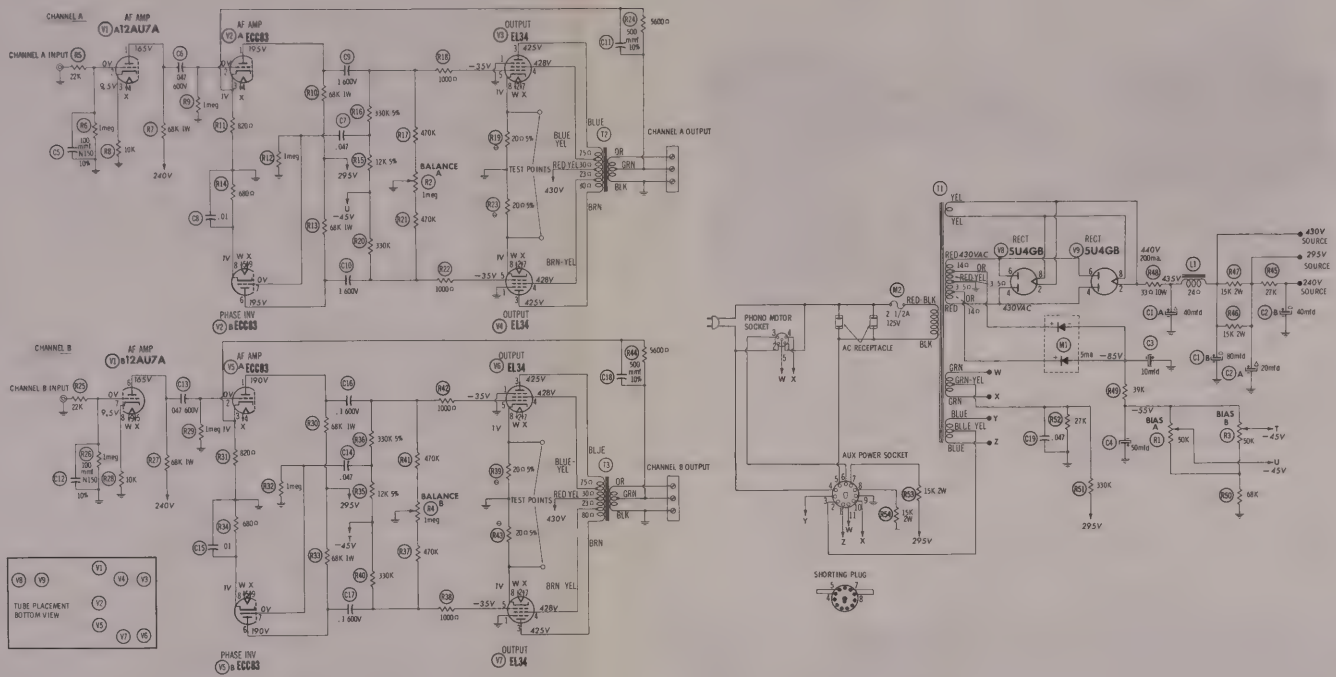
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND MISC. IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AL7A	*100K	1meg	10K	27K	27K	*100K	1meg	10K	27K
V2	ECC83 12AX7	*75K	1meg	820Ω	27K	27K	*75K	1meg	680Ω	27K
V3	EL34 6CA7	0Ω	27K	*160Ω	*90Ω	330K	TP	27K	20Ω	
V4	EL34 6CA7	0Ω	27K	*165Ω	*80Ω	330K	TP	27K	20Ω	
V5	ECC83 12AX7	*75K	1meg	820Ω	27K	27K	*75K	1meg	680Ω	27K
V6	EL34 6CA7	0Ω	27K	*160Ω	*90Ω	330K	TP	27K	20Ω	
V7	EL34 6CA7	0Ω	27K	*165Ω	*80Ω	330K	TP	27K	20Ω	
V8	5U4GB	NC	1	NC	17Ω	NC	17Ω	NC	1	
V9	5U4GB	NC	1	NC	17Ω	NC	17Ω	NC	1	

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
1 MEASURED FROM PIN 8 OF V9.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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PILOT
MODEL SA-260

PHOTOFACT® Folder

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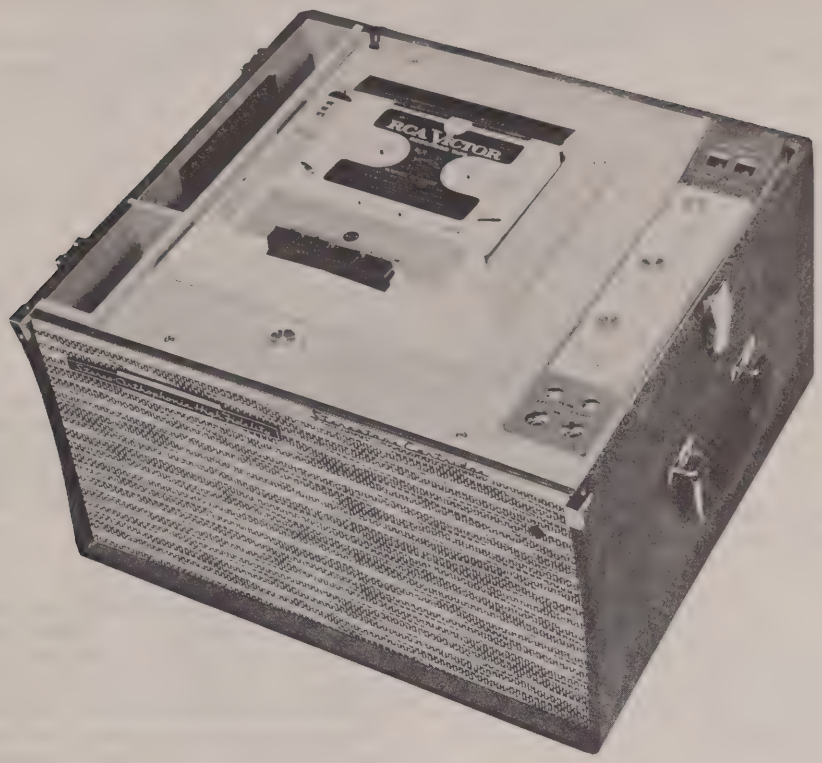
RCA VICTOR MODEL SCP-2 (Ch. RS-176, TCT-2)

RCA VICTOR MODEL
SCP-2 (Ch. RS-176, TCT-2)



RCA VICTOR MODEL
SCP-2 (Ch. RS-176, TCT-2)

GENERAL INFORMATION

RCA Model SCP-2 tape recorders consist of a TCT-2 tape transport and an RS-176 amplifier. The Model SCP-2 tape recorder plays and records both monaural and stereo recordings. A tape cartridge is required.

This recorder has an automatic shut-off to stop the mechanism when the tape is wound from the supply reel to the take-up reel, or vice versa. The tape transport controls are the push-button type.

The Model SCP-2 recorder has a safety switch to prevent accidental erasure of a prerecorded tape.

The recorder has one tape speed, 3 3/4 ips. When a fully loaded four-track cartridge is used, the playing and recording times are one hour for a stereo tape and two hours for a monaural tape.

The Model SCP-2 tape recorder operates on 110-120 volts, 60 cycles AC only.

Manufactured by:

Radio Corporation of America
RCA Victor Radio and "Victrola" Division
Camden 8, New Jersey

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CQ413

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SET 469 FOLDER 15

PREPARING FOR OPERATION

1. Place recorder on a level surface.
2. Remove carrying-case lid.
3. Plug power cord into any convenient outlet of proper voltage and frequency rating.
4. Remove the two microphones and tape cartridges from their storage compartment.

FUNCTION OF CONTROLS

Stop

Depressing this button stops the mechanism in any mode of operation.

Fast Button ►

When this button is depressed, the tape rapidly advances to any desired section.

◄ Fast Button

When this button is depressed, the tape rapidly rewinds onto the supply reel.

Play-Record Button

Depressing this button sets the tape in motion at 3 3/4 ips. This control is used with the Play-Record control on the amplifier.

Forward Automatic Shutoff Pin

In the Forward position, this control automatically shuts off the unit when the tape reaches the end of the hub.

Rewind Automatic Shutoff Pin

In the Rewind position, this control automatically shuts off the unit when the tape reaches the end of the hub.

Guide Bar Switch

The pin on this switch fits into the cutout in the cartridge, and thus prevents accidental erasure of prerecorded tapes.

On-Off Loudness

Pulling this knob up turns the power on. After the unit has been started, the knob may be pushed down; the unit will then automatically shut off at the end of the tape.

Rotating the knob clockwise increases the loudness; counterclockwise, decreases the loudness.

Tone

This control regulates the tone on both channels simultaneously. Turning it clockwise from the normal "N" position on the knob increases the high frequency; counterclockwise, increases the low frequency. This control is used during playback only.

Record-Play

To record, first depress the Record-Play push button on the tape deck. When any other push buttons on the tape deck are depressed to change the mode of operation, the Record-Play control automatically returns to the Play position. Do not turn this control while playing a prerecorded tape cartridge. A warning buzz will be heard if this is attempted.

Function (Aux-Str-Mon)

When this control is turned to the Aux position, the internal speakers of the tape recorder can be used as a left-channel speaker system for a stereophonic phonograph. When playing or recording stereophonic tape cartridges, turn the control to the Str position. To play or record monaurally, turn it to Mon 1 or Mon 2. Mon 1 plays tracks A1 and B1; Mon 2 plays tracks A2 and B2.

Balance

This control regulates the loudness of the two sound channels during playback. Midrange is the normal position for the control. In monaural operation, this control regulates the volume of Tracks A2 or B2 independently from the Loudness control. If the Balance control is correctly adjusted for stereophonic operation, it need not be readjusted for monaural operation.

SPLICING THE CARTRIDGE TAPE

1. With the cartridge assembled, push the brake slide forward. This permits the tape to be pulled out so that it will be accessible.
2. Butt the two ends of the tape together.
3. Fasten the two ends with splicing tape. Trim off the excessive tape evenly with the edge of the recording tape.
4. Tighten the tape by turning the supply reel clockwise or the take-up reel counterclockwise.

If it is necessary to disassemble the cartridge in order to splice the tape, proceed as follows:

a. Remove the two locking screws.

b. Remove cartridge case side "A".

c. Remove the Mylar spacer.

d. Repeat steps 1 through 4.

e. To reassemble, reverse the foregoing procedure.

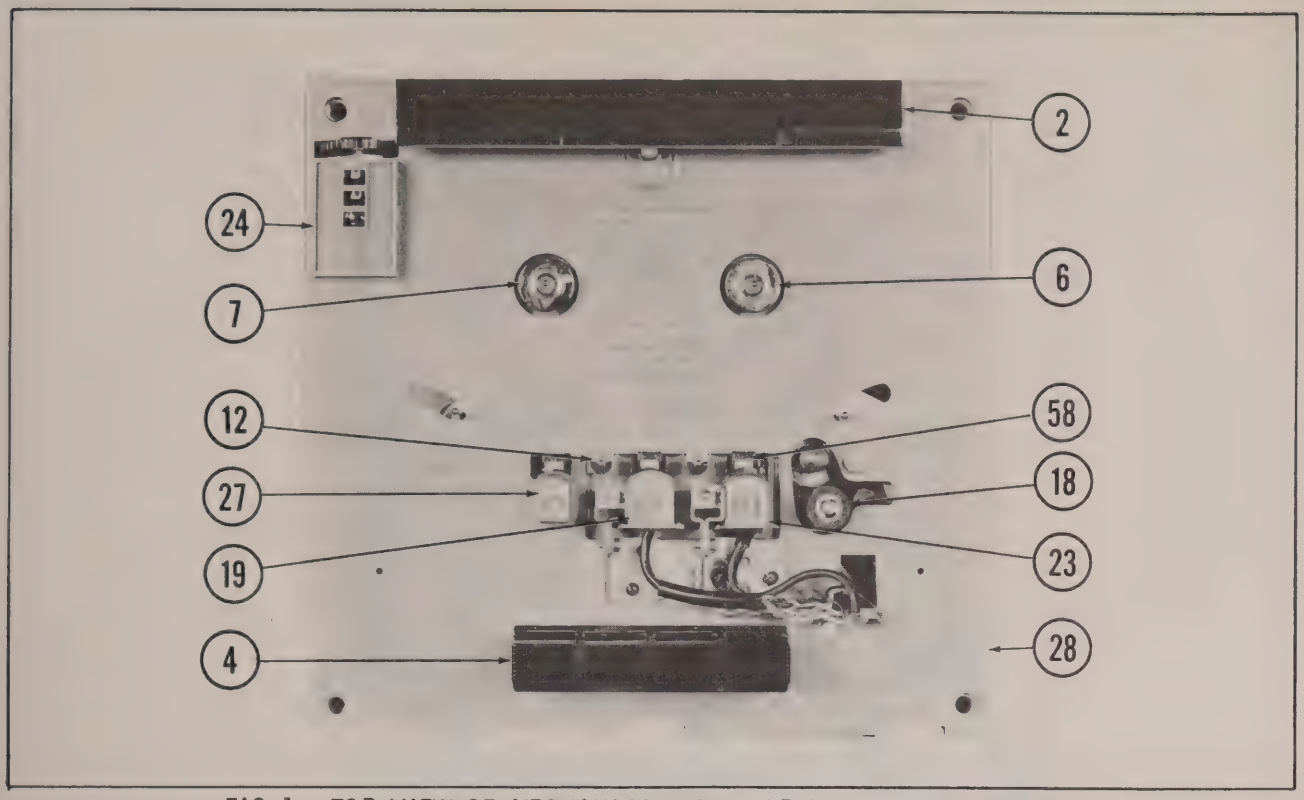


FIG. 1 TOP VIEW OF MECHANISM WITH TOP DRESS PLATE REMOVED.

DISASSEMBLY

To Remove Tape Transport from Case

1. Remove the ventilation screen on the bottom of the case.
2. Unplug the head cables and power cables from the amplifier.
3. Remove the tape-head escutcheon.
4. Remove the four screws holding the tape transport to the case; then lift the tape transport from the case.
5. To reassemble, reverse the foregoing procedure.

To Remove Amplifier from Case

1. Unplug the connecting cable to the transformer.
2. Remove the control knobs.
3. Remove the hex nut from the Balance control.
4. Remove the seven screws holding the mounting board to the case. Remove the board.
5. Disconnect the speaker leads.
6. Disconnect the leads to the right-channel speaker jack.
7. Remove the four hex head screws holding the amplifier to the side of the case. Lift the amplifier from the case.
8. To reassemble, reverse the foregoing procedure.

ADJUSTMENTS

Play-Record Push Button

When the Play-Record push button is latched, 8 to 12 ounces of force should be required to trip the Forward shutoff pin. Turn screw (77) on forward toggle adjusting bracket (80) clockwise to reduce the force, counterclockwise to increase the force.

Fast Rewind

A force of 8 to 12 ounces should be required to trip the rewind shutoff pin. Turn screw (64) on rewind toggle adjusting bracket (61) clockwise to reduce the force, counterclockwise to increase the force.

Fast Forward

Turn eccentric stud (97) on fast forward actuating lever (65) until the 8 to 12 ounce-force needed to trip the Forward shutoff pin is obtained.

Pressure Pad

1. Disconnect the power.
2. Check felt pressure pads (58) and (142). They must be centered on the heads, and the pressure pad assembly must have minimum end play.

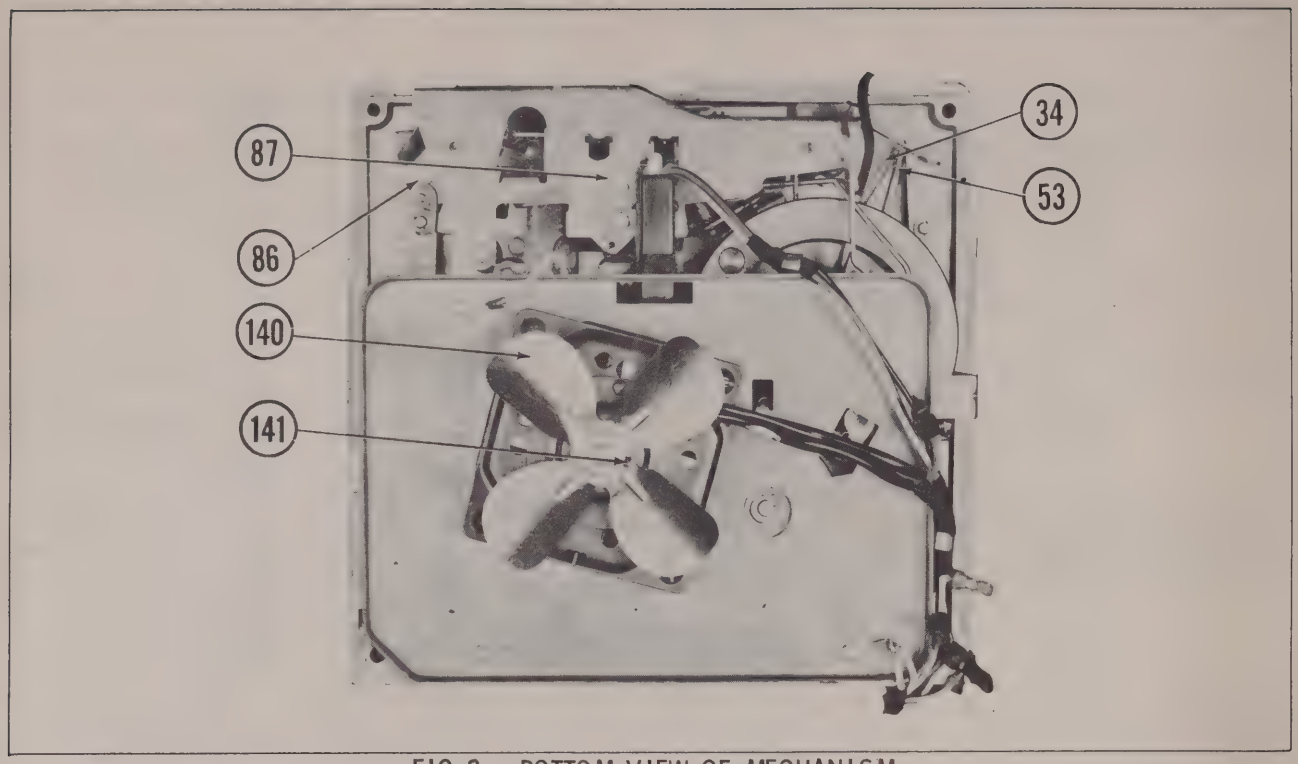


FIG.2 BOTTOM VIEW OF MECHANISM.

3. Insert a piece of tape between the heads and tape guides, and depress the Play-Record push button.

4. The force required to pull the tape past the heads is 2 to 3 ounces.

5. Adjust screw (57) until this force is obtained.

Pressure Roller

1. Connect the transport to the power source.

2. Place a loaded tape cartridge on the transport, and depress the Play-Record push button.

3. Connect a spring balance to the pressure roller. A force of 3 to 3 1/2 pounds should be needed to pull the pressure roller away from the capstan.

4. Turn adjusting nut (89) until this force is obtained.

Turntable Height

The turntable height has been adjusted at the factory. Therefore, no further adjustment should be required. If it becomes necessary to remove the turntables in order to service the shaft assemblies, the shims must be kept with their respective shafts.

Head Alignment

1. Adjust the vertical position of the erase and play-record heads by loosening locking screws (22), so that their faces are parallel to the tape guides.

2. Place a loaded test tape cartridge on the mechanism.

3. Connect an output meter between the right-channel output and ground.

4. Turn the track selector to Mon 1 and the Volume control to maximum.

5. Adjust the vertical position of the play-record head for minimum output while playing the low-frequency section of the tape.

6. Loosen screws (143) and tighten one screw to obtain maximum output for the azimuth adjustment. Tighten both screws while observing the output level.

7. To check the erase head, make a recording on a blank tape. Rewind and play back the tape, to make sure the mechanism has recorded.

8. Rewind the tape, turn the volume to minimum, and place the mechanism in Record.

9. Rewind the tape, and play it back at maximum volume to see if it has been erased.

Pressure Roller Alignment

If cross talk occurs between tracks, proceed as follows:

1. Disconnect the power source.

2. Remove pressure roller (18) from the pressure roller stud.

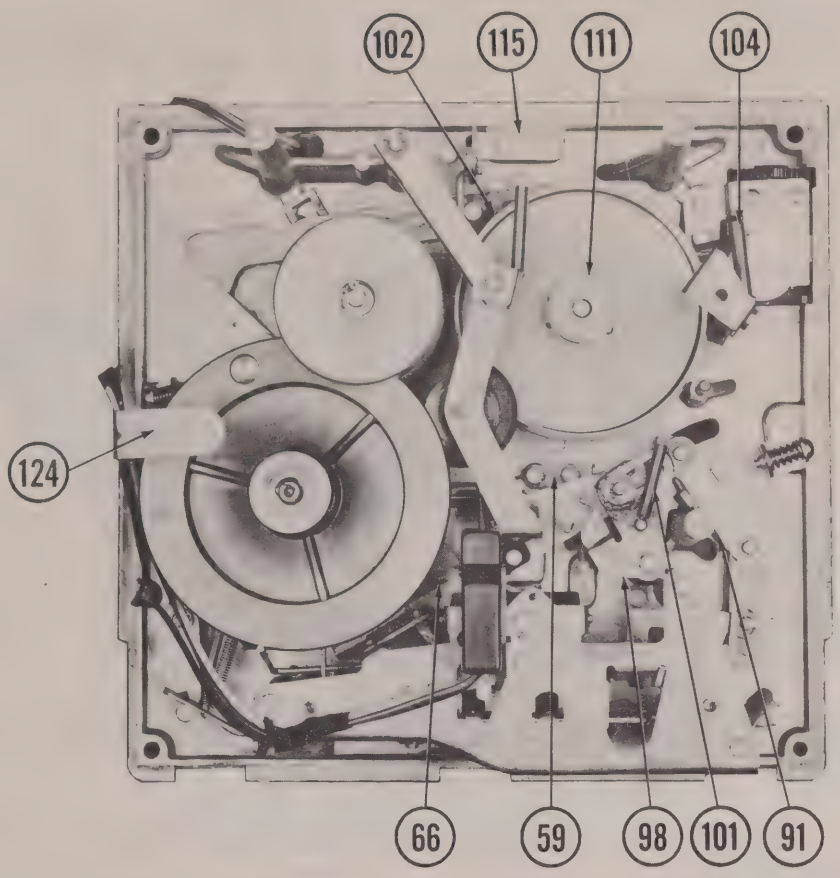


FIG.3 BOTTOM VIEW OF TAPE DECK WITH MOTOR MOUNTING PLATE REMOVED.

3. Use a hollow tool to align the stud.

4. Replace pressure roller (18), and check for cross talk.

Clutch

NOTE: Before making any clutch adjustment, check the following:

1. Make sure the set screws are tight on the clutch dogs.

2. Check the tape cartridge for coning. If one of the turntables is too low, the tape will wind into a concave cone; if too high, the tape will wind into a convex cone. Either condition will create friction, which will cause the clutch to slip.

To regulate the friction:

1. If more or less than 3 to 4 ounces of force are required to cause the take-up clutch to slip in the Play position, turn screw (73) on the take-up clutch assembly.

2. If more or less than 14 to 20 ounces of force are required to cause the rewind clutch to slip in the Fast Rewind position, turn screw (73) on the rewind clutch assembly.

3. If more or less than 14 to 20 ounces of force are required to cause the fast forward clutch to slip in the Fast Forward position, turn screw (73) on the fast-forward clutch assembly.

Recording Level Indicators (R3, R4)

1. Connect an audio generator, tuned to 1000∿, to the Left Channel Radio-Phono jack.

2. Connect AC VTVM to point Ⓐ and chassis.

3. Actuate guide bar switch by using a tape cartridge. Set transport switches to "Record" and "Track 1".

4. Adjust generator output and recorder Loudness control for 4.5 volts on VTVM.

5. Adjust Normal control (R3) counterclockwise then clockwise until Normal neon bulb barely lights.

6. Adjust generator output and recorder Loudness control for 9 volts on VTVM.

7. Adjust Overload control (R4) counterclockwise then clockwise until Overload bulb barely lights.

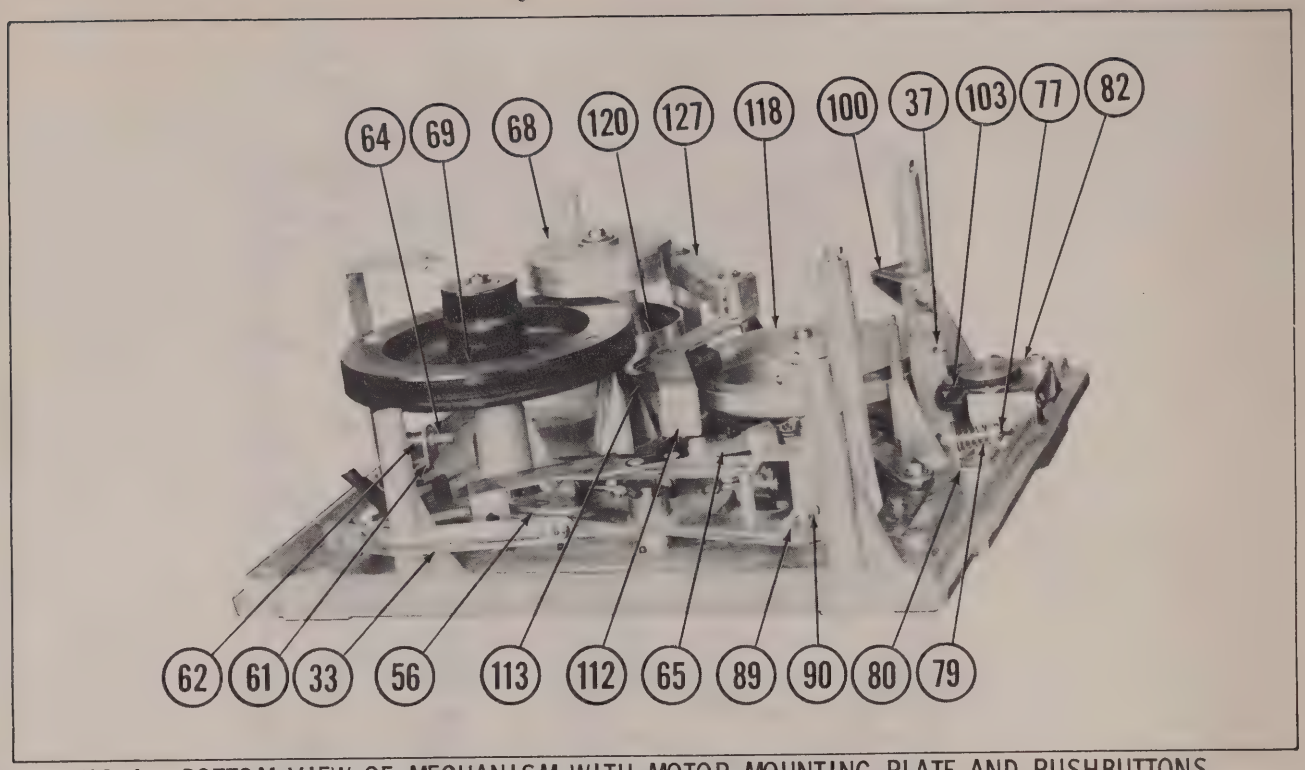


FIG.4 BOTTOM VIEW OF MECHANISM WITH MOTOR MOUNTING PLATE AND PUSHBUTTONS REMOVED.

Recording Bias (C44, C45)

NOTE: Two color dots are located on the recording head. The top color refers to Track 2 (adjust C44); the bottom color refers to Track 1 (adjust C45).

Track 1

1. Remove bottom cover screen and allow recorder to operate for 15 minutes.
2. Connect a calibrated scope (low capacity probe) to point Ⓑ and chassis.
3. Set recorder to "Record" and "Track 1", Loudness at minimum.
4. Adjust C44 for voltage indicated in chart.

Track 2

1. Connect the scope to point Ⓒ and chassis.
2. Set recorder to "Record" and "Track 2", Loudness at minimum.
3. Adjust C45 for voltage indicated in chart.

COLOR DOT ON HEAD	VOLTAGE
Blue	16.8V p-p
Yellow	19.6V "
Black	22.4V "
Brown	23.8V "
Orange	25.2V "
Red	26.6V "
Green	28.0V "
White	30.8V "

LUBRICATION

Additional lubrication should not be required for a long time, since the mechanism has been lubricated before leaving the factory. However, if parts are removed for repair or replacement, lubricate them with light grease, as follows:

1. Push-button bracket shafts.
2. Area between rewind toggle arm (112) and rib on motorboard (128).
3. Surfaces of push-button bracket locking slide lever (46).
4. Ear of fast-forward idler mounting lever (112).
5. Grease cup under flywheel (69).

Lubricate the following with a clinging-type oil:

1. Idler shafts.
2. Toggle link joints.
3. Pivot joints.
4. Capstan and turntable shaft bearings.

NOTE: Do not overlubricate the turntable shafts. Excessive lubrication may seep onto the clutch linings and cause the clutches to slip.

CLEANING

The capstan, pressure roller (18), tape guide posts (12), record-playback head (21), erase head (19), and tape tensioning head (27) may accumulate tape coating oxide, which is worn off the tape as it passes these parts. Use a soft cloth and alcohol to clean these parts.

Clean the idler wheels, pulleys, and clutch linings with a good cleaning solvent if they should become greasy or oily.

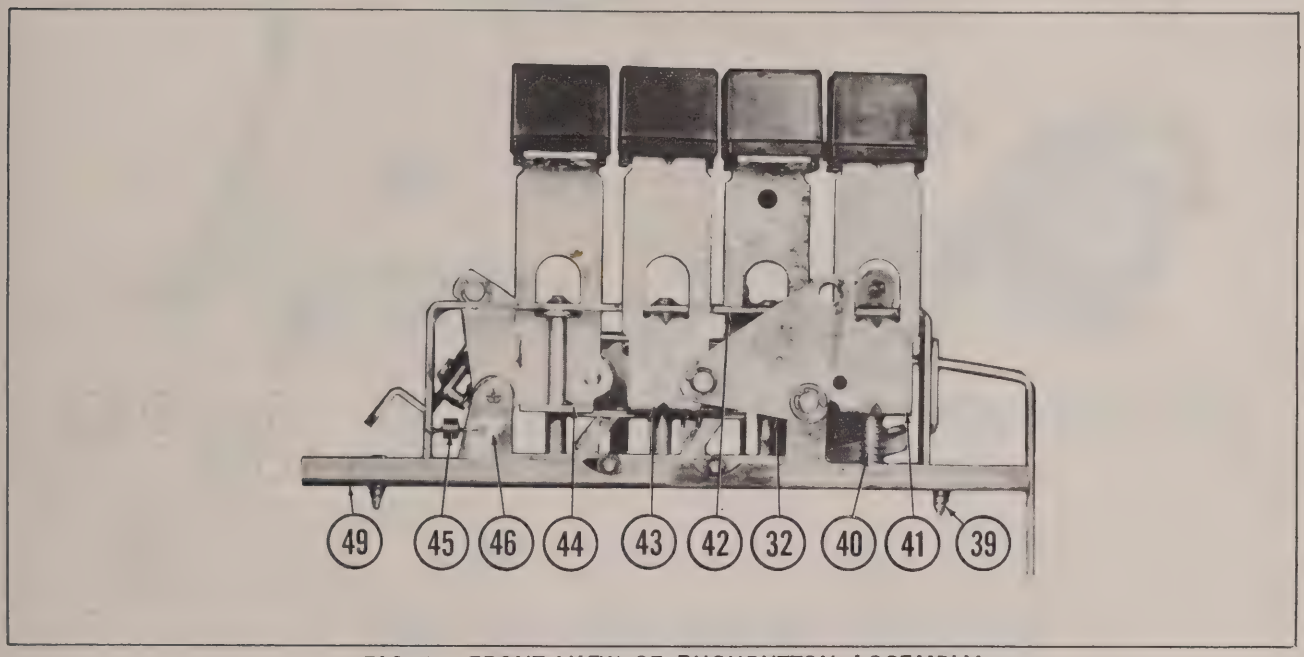


FIG.5 FRONT VIEW OF PUSHBUTTON ASSEMBLY.

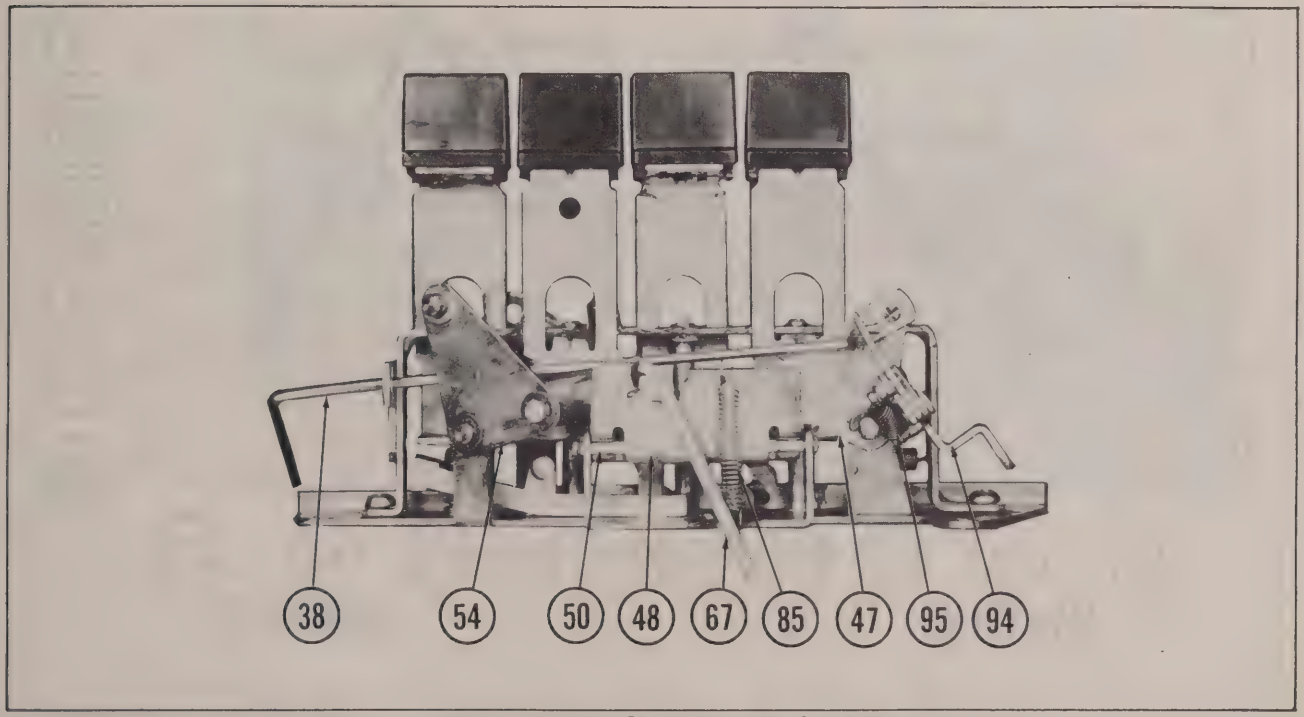


FIG.6 REAR VIEW OF PUSHBUTTON ASSEMBLY.

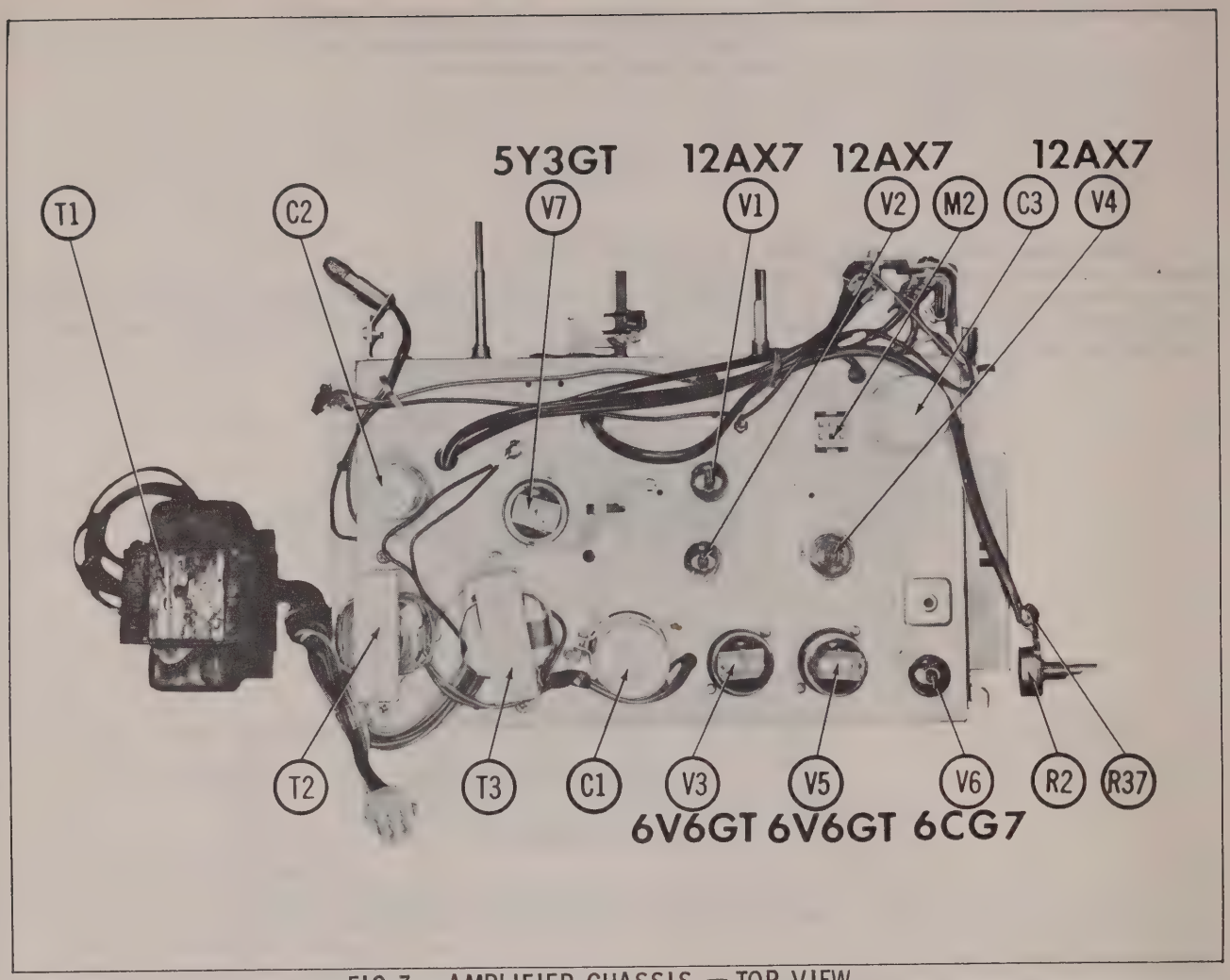


FIG.7 AMPLIFIER CHASSIS — TOP VIEW.

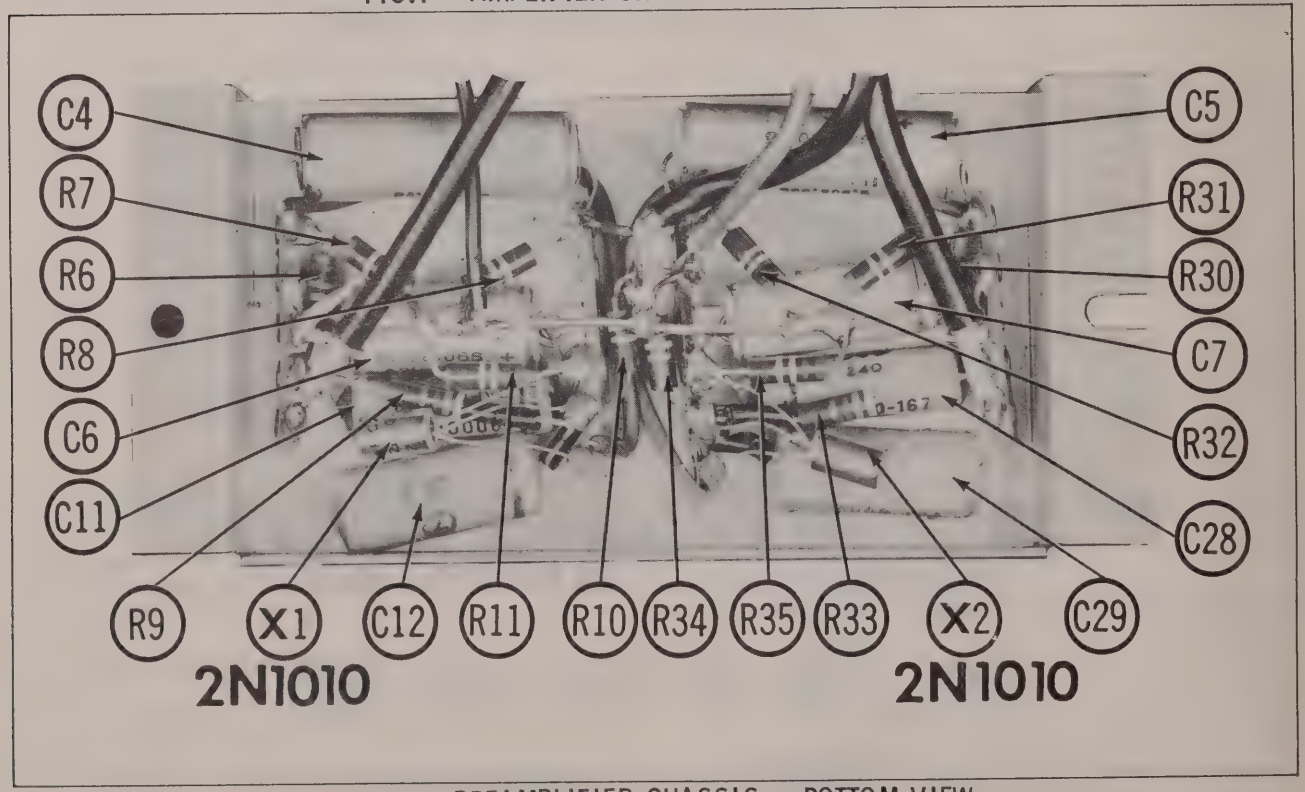
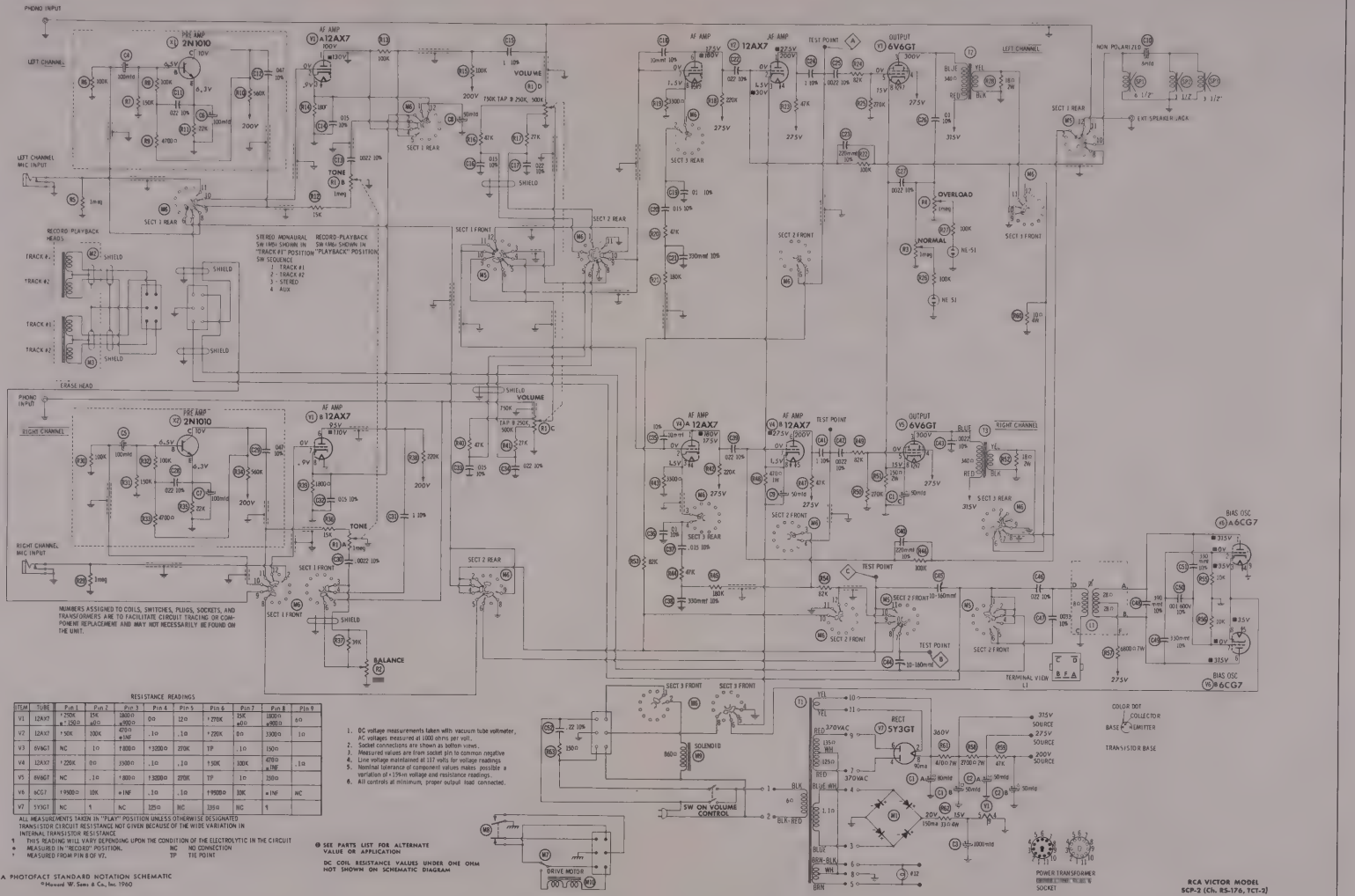


FIG.8 PREAMPLIFIER CHASSIS— BOTTOM VIEW.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	*250K *130Ω	15K 680Ω	180Ω *90Ω	0Ω	12Ω	*270K	15K 680Ω	180Ω *90Ω	6Ω
V2	12AX7	*50K	100K	470Ω *INF	.1Ω	.1Ω	*220K	0Ω	3300Ω	1Ω
V3	6V6GT	NC	1Ω	†800Ω	†3200Ω	270K	TP	.1Ω	150Ω	
V4	12AX7	*220K	0Ω	3300Ω	.1Ω	.1Ω	*50K	100K	470Ω *INF	.1Ω
V5	6V6GT	NC	.1Ω	†800Ω	†3200Ω	270K	TP	1Ω	250Ω	
V6	6CG7	†950Ω	10K	*INF	.1Ω	.1Ω	†950Ω	10K	*INF	NC
V7	5Y3GT	NC	¶	NC	125Ω	NC	135Ω	NC	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
* MEASURED IN "RECORD" POSITION. NC NO CONNECTION
† MEASURED FROM PIN 8 OF V7. TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom view.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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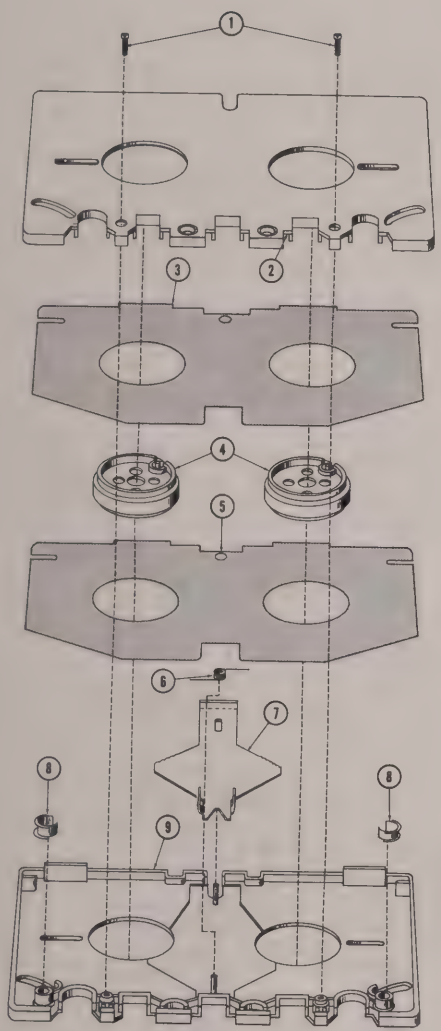
RCA VICTOR MODEL 5CP-2 (Ch. RS-176, TCT-2)



A PHOTOFACT "EXPLODED" VIEW
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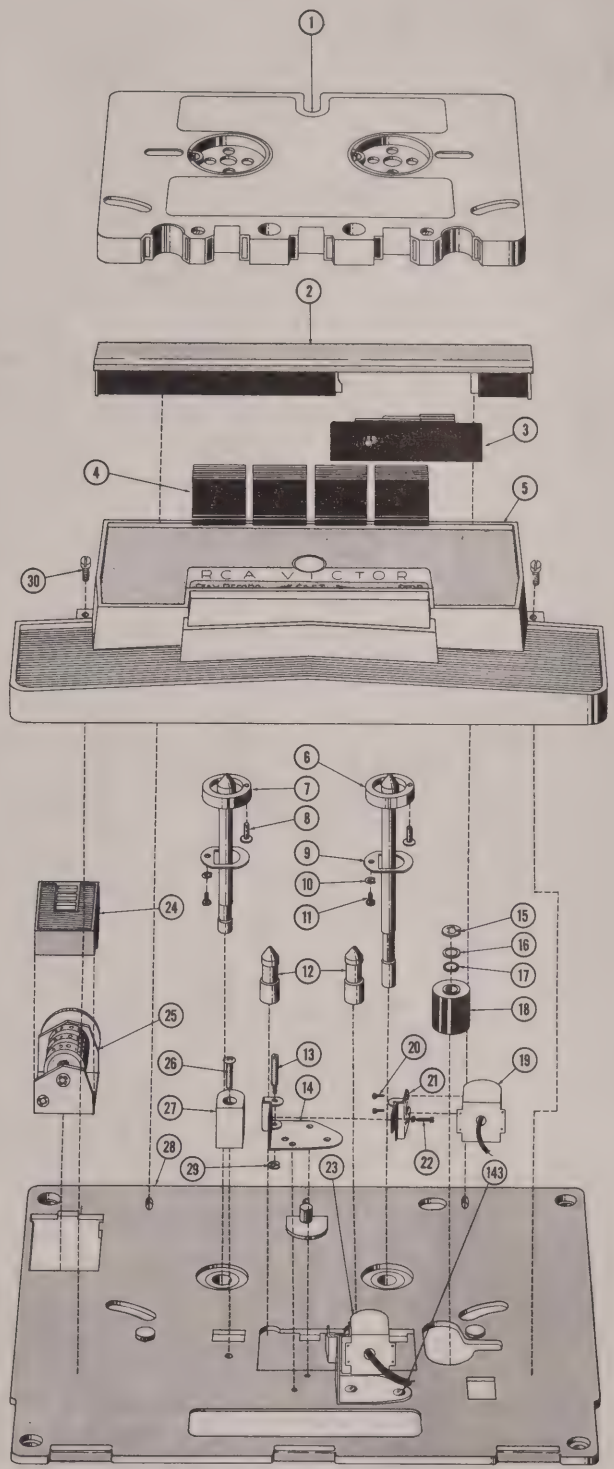
FIG. 9 A
EXPLODED VIEW OF TAPE CARTRIDGE.



A PHOTOFACT "EXPLODED" VIEW
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FIG. 9B
EXPLODED VIEW OF PARTS ABOVE MOTORBOARD.

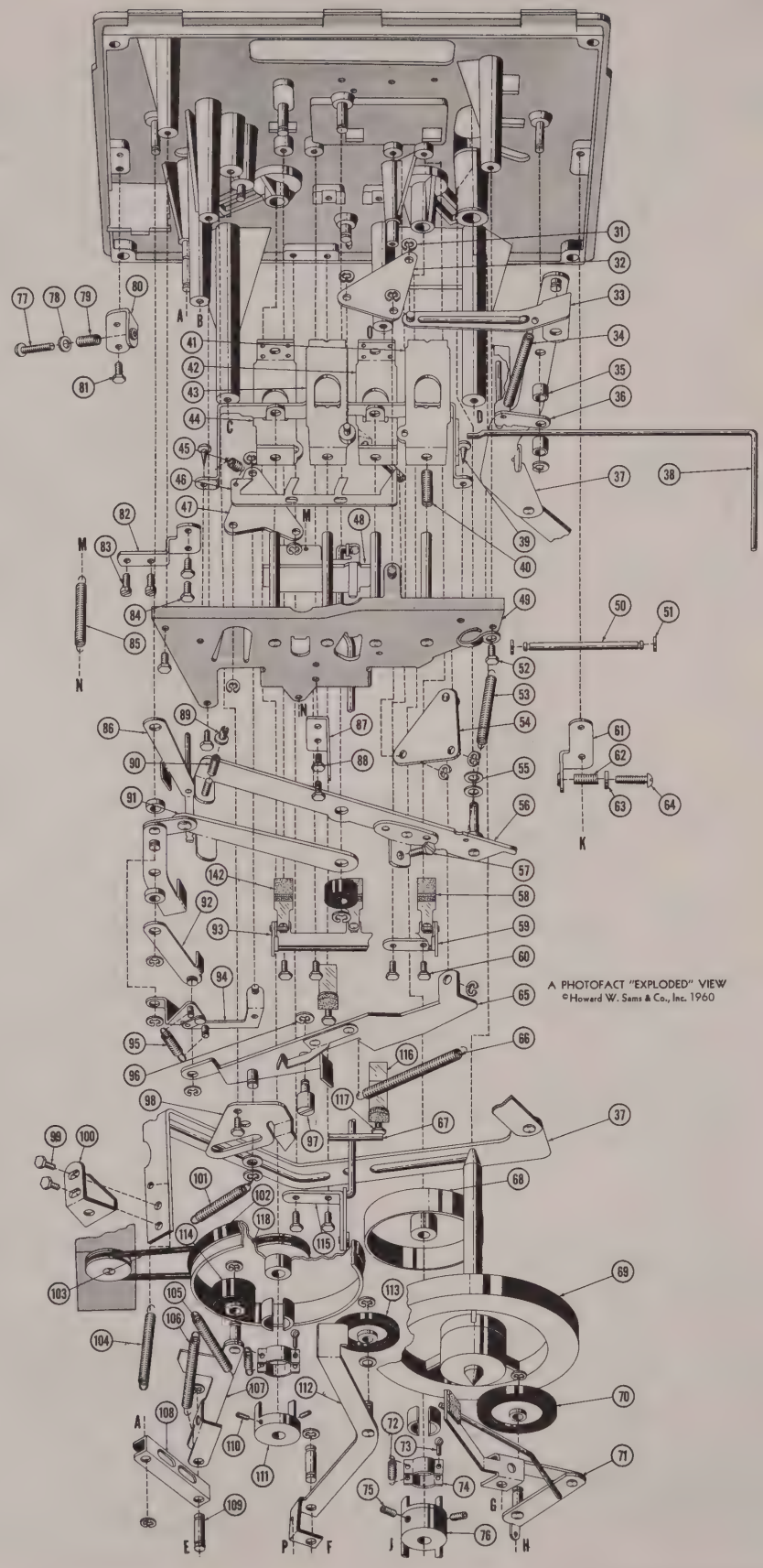


FIG. 9C EXPLODED VIEW OF PARTS BELOW MOTORBOARD

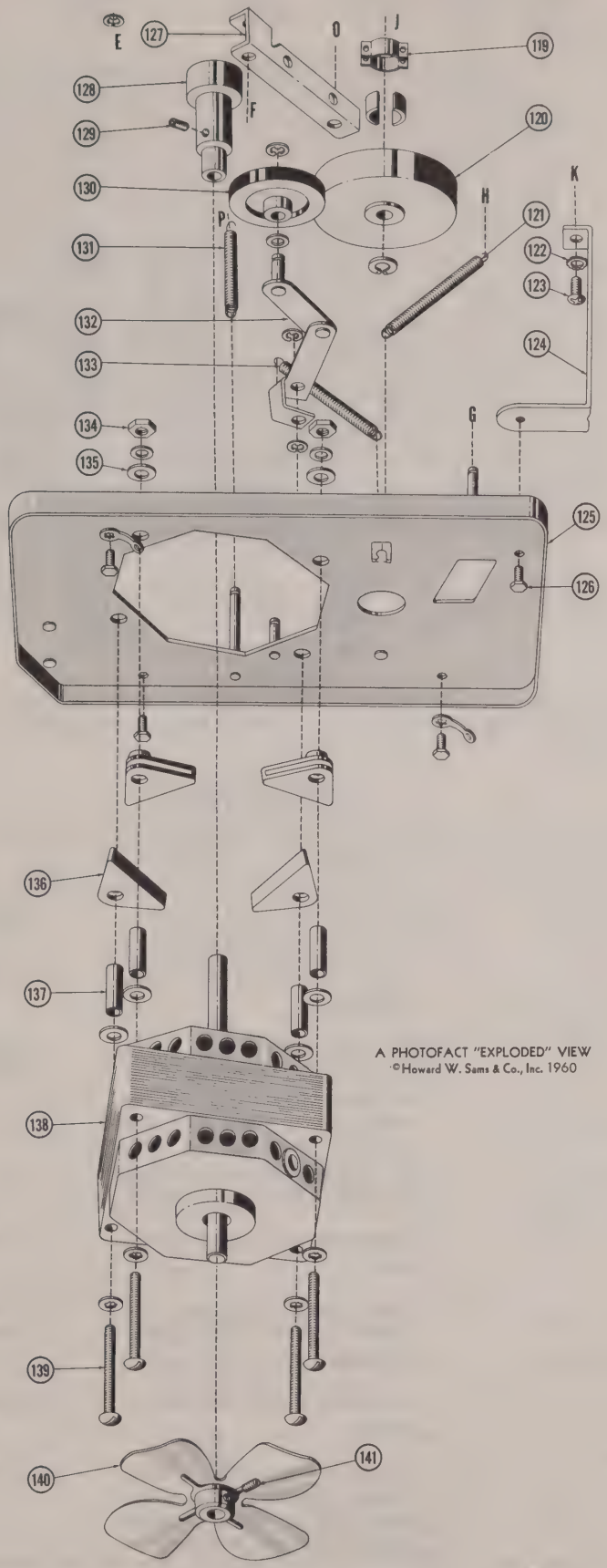


FIG. 9D EXPLODED VIEW OF PARTS BELOW MOTORBOARD (CONT.)

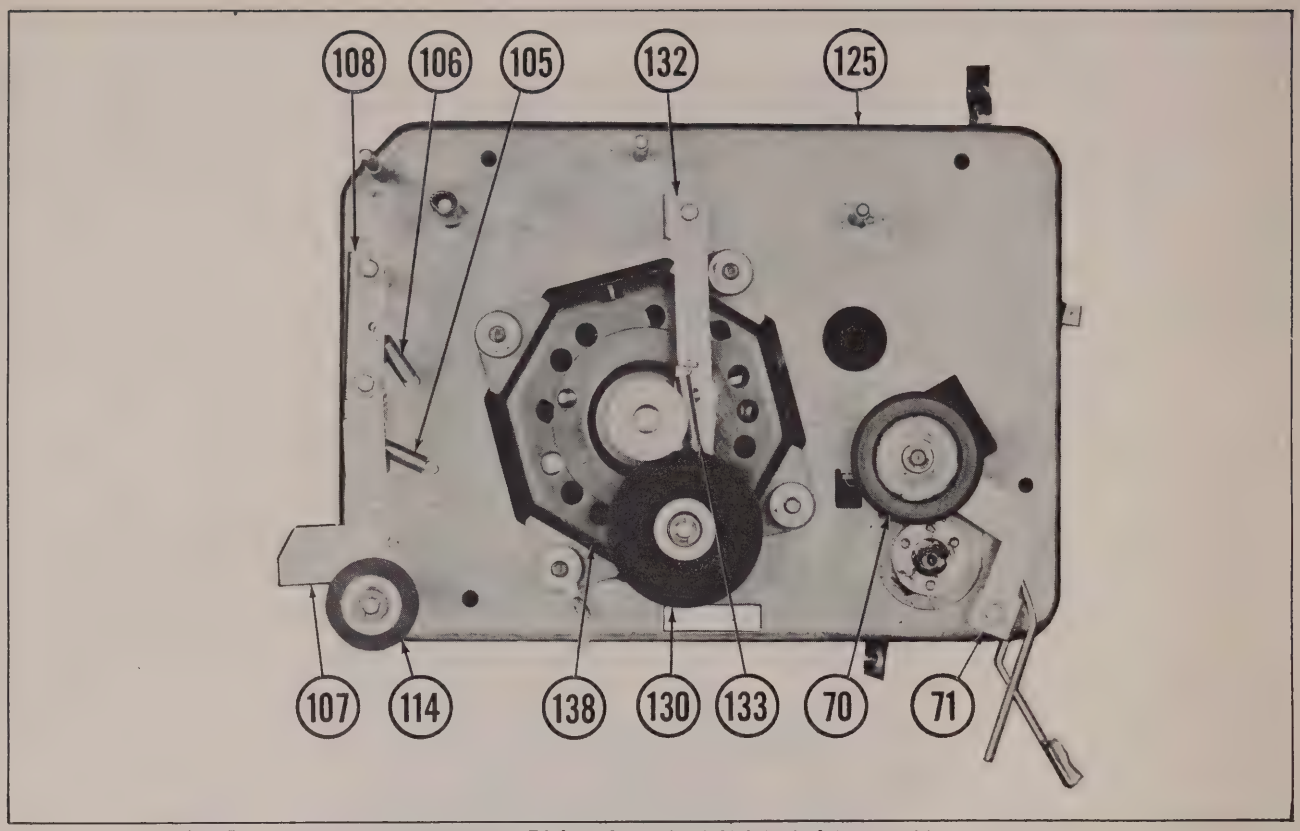


FIG. 10 MOTOR MOUNTING PLATE & DRIVE IDLERS ASSEMBLY.

TROUBLE CHART

Symptom	Cause	Remedy
No fast forward or rewind.	1. Insufficient clutch torque.	1. See "Clutch Adjustment."
	2. Take-up clutch spring (72) weak, or unhooked on clutch assembly.	2. Replace or rehook take-up clutch spring (72).
	3. Fast forward idler spring (131) on fast forward idler mounting lever (112), or rewind arm spring (105) and rewind idler spring (106) on rewind idler mounting lever (107) weak or unhooked.	3. Replace or rehook springs (131), (105), and (106).
Wow.	1. Motor drive pulley (128) slipping.	1. Tighten set screws (129).
	2. Insufficient pressure of pressure roller (18) against capstan.	2. See "Pressure Roller Adjustment."
	3. To much torque on take-up clutch.	3. See "Clutch Adjustment."
	4. Capstan, pressure roller, idler wheels, and pulleys have oil or other foreign matter on their surfaces.	4. Clean these parts with alcohol.
Will not shutoff automatically.	1. Tape on wrong side of shutoff pin (36) or (86).	1. Loosen screws (99) and shift rewind idler striker bracket (100).

Symptom	Cause	Remedy
	2. Not enough clutch torque.	2. See "Clutch Adjustment."
Mechanism shuts off before end of tape is reached.	1. Tripping force too small.	1. See "Pin Adjustment."
Does not record or erase.	1. Heads out of alignment.	1. See "Head Alignment."
	2. Pressure pads out of adjustment or worn.	2. Adjust or replace pressure pads.
	3. Tape threaded incorrectly.	3. The dull-coated side of tape must face outward.
	4. Guide bar switch not positioned correctly.	4. Loosen screws, and move right side of guide bar.
	5. Head or guide bar switch defective.	5. Replace head or guide bar switch.
Will not take up.	1. Tape on wrong side of shutoff pin.	1. Rethread the tape.
	2. Spring (72) on take-up clutch weak or unhooked.	2. Replace or connect spring (72).
	3. Take-up idler spring (121) on take-up idler mounting lever (71) weak or unhooked.	3. Replace or connect take-up idler spring (121).
	4. Take-up clutch improperly adjusted.	4. See "Clutch Adjustment."
	5. Lubricant has become dry in the take-up clutch lining.	5. Replace clutch assembly.
	6. Take-up idler shift rod (38) disconnected from take-up idler mounting lever (71).	6. Reconnect take-up idler shift rod (38).
Push buttons do not latch when depressed.	1. Push-button locking slide spring (45) weak or unhooked.	1. Replace or reconnect push-button locking slide spring (45).
	2. Pressure roller force too great, preventing the Play-Record push button from latching.	2. See "Pressure Roller Adjustment."
Tape binding in cartridge.	1. Cartridge warped.	1. Replace cartridge.
	2. Cartridge not seated properly on transport bosses.	2. Remove cartridge and reseat on bosses.
	3. Turntables too high or too low.	3. Check shims under turntables.
Tape breaks.	1. Excessive clutch friction.	1. See "Clutch Adjustment."
	2. Tripping force of shutoff pins (36) and (86) too great.	2. See "Shutoff Pin Adjustments."
	3. Excessive slack within the cartridge.	3. Turn take-up reel counter-clockwise to take up the slack.
	4. Insufficient take-up clutch torque, permitting the tape to wrap around the capstan.	4. See "Take-up Clutch Adjustment."
	5. Pressure roller (18) applying too much force against the capstan.	5. See "Pressure Roller Adjustment."

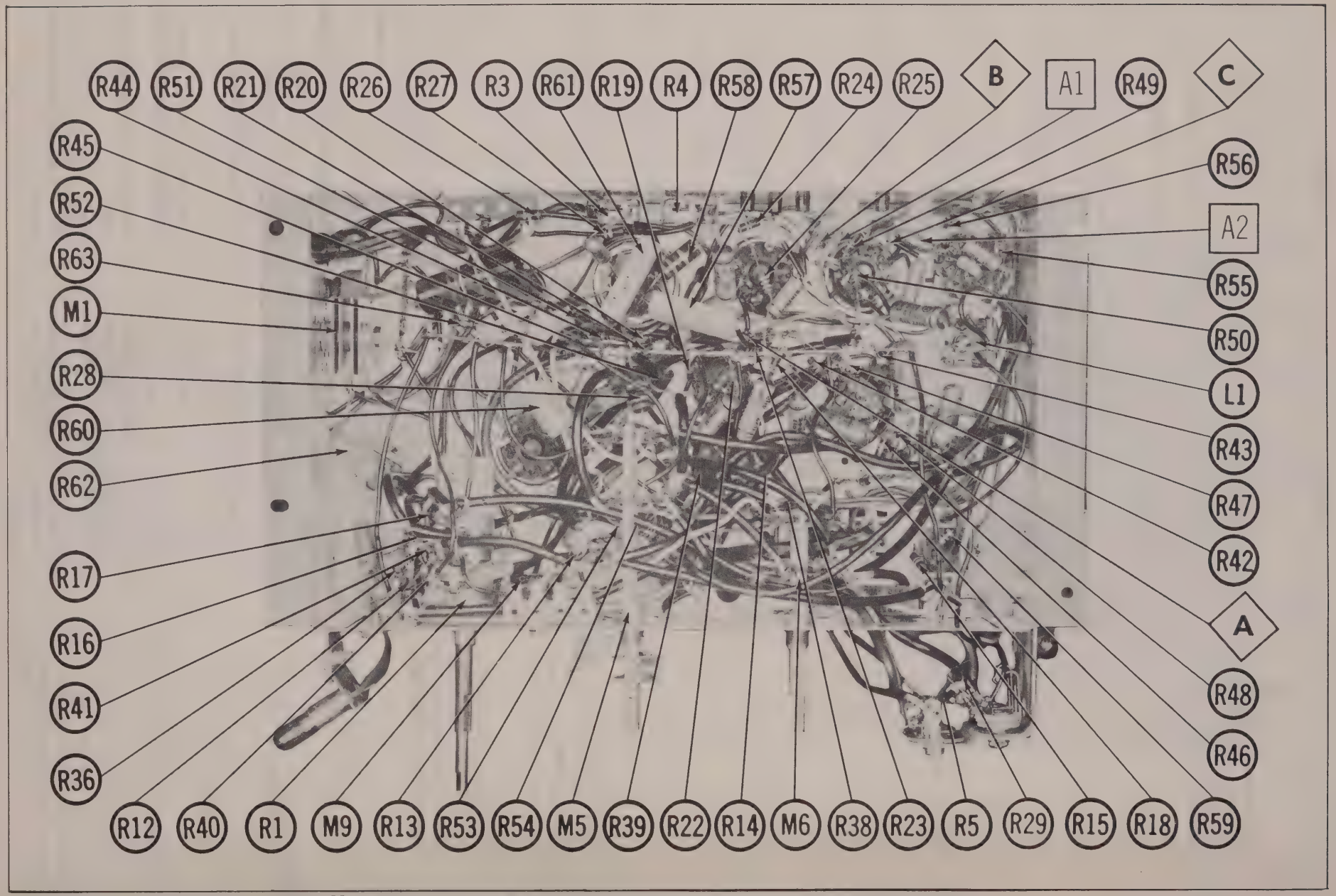


FIG. 11 AMP CHASSIS BOTTOM VIEW - RESISTOR, MISC & ALIGNMENT IDENT.

AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V2	Left Channel AF Amp. -	12AX7
V3	Left Channel Output	6V6GT
V4	Right Channel AF Amp. -	12AX7
V5	Right Channel Output	6V6GT
V6	Bias Oscillator	6CG7
V7	Rectifier	5Y3GT

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1010	Left Channel Preamplifier		2N1010			NPN
X2	2N1010	Right Channel Preamp.		2N1010			NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	●80	450	105218	AFH3-149-35	C1110	FP368.5	TMT-136	TVL-3746	
B	■50	450							
C	▲50	25							
C2A	●50	300	107040	AFH2-33	B0260	FP239	TMD-32	TVL-2767	
B	▲50	250							
C3	1000	15	103257	AFH1-02	A0060	WP039	TMS-4	TVL-1165	
C4	100	25	108020	SRE25V100	BBR100-25	TC2501	TD-100-25	TVA-1207	
C5	100	25	108020	SRE25V100	BBR100-25	TC2501	TD-100-25	TVA-1207	
C6	100	10	108019	SRE12V100	NL100-10	TT15X100	ML100-15	TE-1162	
C7	100	10	108019	SRE12V100	NL100-10	TT15X100	ML100-15	TE-1162	
C8	50	6	78573	SRE6V50	BBR50-6	TT6X50	TD-50-6	TVA-1100	
C9	50	6	78573	SRE6V50	BBR50-6	TT6X50	TD-50-6	TVA-1100	
C10	8	10 NP	100509	NP-PRS6200	BBR16-90 †	TCN108		TVAS-1112 *	

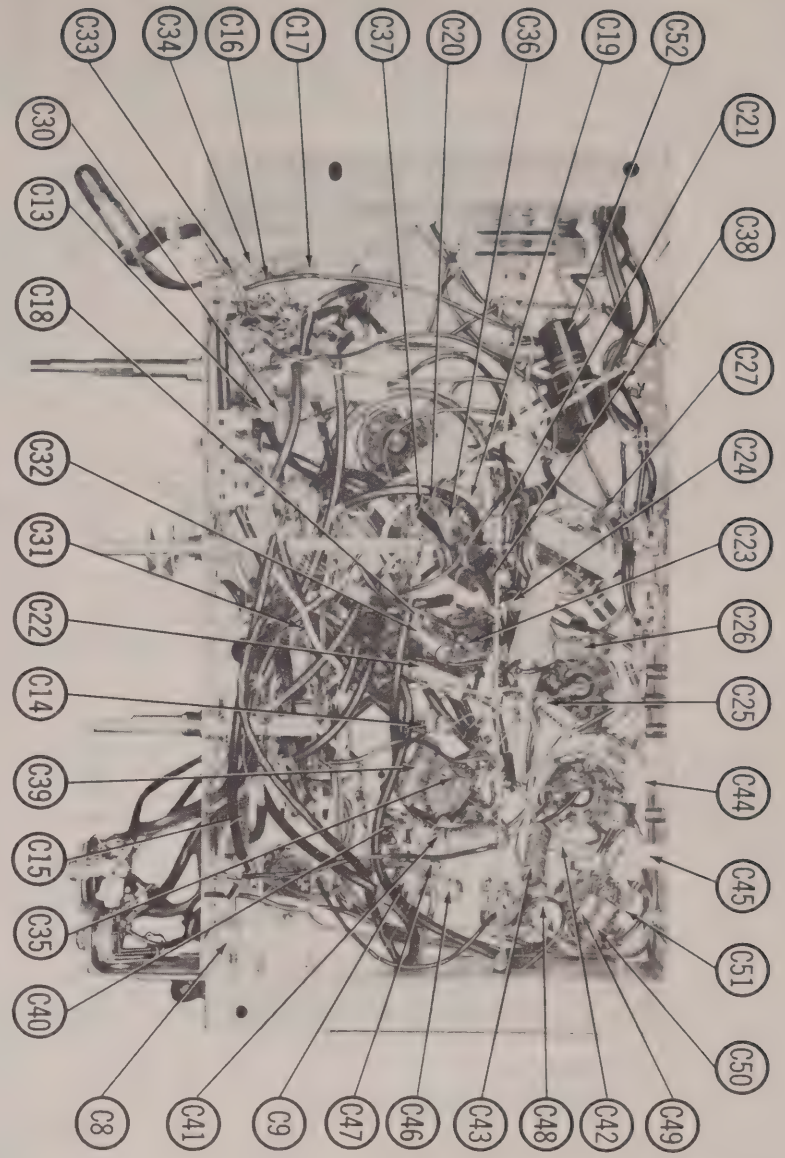
† Use two units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C11	.022 400V 10%		V84C4S22 10%		PM4S22	4DP-2-223	GEM-1612	4TM-S22
C12	.047 400V 10%		V84C4S47 10%		PM4S47	4DP-3-473	GEM-1615	4TM-S47
C13	.0022 400V 10%		V84C4D22 10%		PM6D22	6DP-1-222	GP222	6TM-D22
C14	.015 200V 10%		V84C2S15 10%		PM4S15	4DP-1-153		4TM-S15
C15	.1 400V 10%		V84C4P1 10%		PM4P1	4DP-3-104		4TM-P1
C16	.015 200V 10%		V84C2S15 10%		PM4S15	4DP-1-153		4TM-S15
C17	.022 200V 10%		V84C2S22 10%		PM4S22	4DP-2-223	GEM-1612	2TM-S22
C18	10 10%		NPO-S1 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C19	.01 200V 10%		V84C2S1 10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C20	.015 400V 10%		V84C4S15 10%		PM4S15	4DP-1-153		4TM-S15
C21	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C22	.022 400V 10%		V84C4S22 10%		PM4S22	4DP-2-223	GEM-1612	4TM-S22
C23	220 10%		NPO-S1 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C24	.1 400V 10%		V84C4P1 10%		PM4P1	4DP-3-104		4TM-P1
C25	.0022 400V 10%		V84C4D22 10%		PM6D22	6DP-1-222	GP222	6TM-D22
C26	.01 400V 10%		V84C4S1 10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C27	.0022 400V 10%		V84C4D22 10%		PM6D22	6DP-1-222	GP222	6TM-D22
C28	.022 400V 10%		V84C4S22 10%		PM4S22	4DP-2-223	GEM-1612	4TM-S22
C29	.047 400V 10%		V84C4S47 10%		PM4S47	4DP-3-473	GEM-1615	4TM-S47
C30	.0022 400V 10%		V84C4D22 10%		PM6D22	6DP-1-222	GP222	6TM-D22
C31	.1 400V 10%		V84C4P1 10%		PM4P1	4DP-3-104		4TM-P1
C32	.015 200V 10%		V84C2S15 10%		PM4S15	4DP-1-153		4TM-S15

AMP CHASSIS—BOTTOM VIEW



RCA VICTOR MODEL
SCP-2 (Ch. RS-176, TCT-2)

FOLDER 15

AMP PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C33	.015 200V 10%		V84C2S15 10%		PM4S15	4DP-1-153		4TM-S15
C34	.022 200V 10%		V84C2S22 10%		PM4S22	4DP-2-223	GEM-1612	2TM-S22
C35	10 10%		NPO-SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C36	.01 200V 10%		V84C2S1 10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C37	.015 400V 10%		V84C4S15 10%		PM4S15	4DP-1-153		4TM-S15
C38	330 10%			D6-331	L10T33	CCD-331	GP330	10TS-T33
C39	.022 400V 10%		V84C4S22 10%		PM4S22	4DP-2-223	GEM-1612	4TM-S22
C40	220 10%		NPO-SI 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C41	.1 400V 10%		V84C4P1 10%		PM4P1	4DP-3-104		4TM-P1
C42	.0022 400V 10%		V84C4D22 10%		PM6D22	6DP-1-222	GP222	6TM-D22
C43	.0022 400V 10%		V84C4D22 10%		PM6D22	6DP-1-222	GP222	6TM-D22
C44	10-160	#105574				463		
C45	10-160	#105574				463		
C46	.022 400V 10%		V84C4S22 10%		PM4S22	4DP-2-223	GEM-1612	4TM-S22
C47	.0033 400V 10%		V84C4D33 10%		PM6D33	6DP-1-332	GEM-1623	6TM-D33
C48	390 10%			D6-391	L10T39	CCD-391	GP339	10TS-T39
C49	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C50	.001 600V 10%		V84C6D1 10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D1
C51	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C52	.22 400V 10%		V84C4P22 10%					

RCA Victor Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	107042					Tone, Right Channel
B	1meg	½						Tone, Left Channel
C	750K *							Volume, Right Channel
D	750K *							Volume, Left Channel
E	Switch							Power, Off-On
R2A	500K		107039	B-60	A47-500K-Z	Q13-133	U48	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg		103260	BX-69	B47-1meg-S	B11-137	TA16L	Left Channel Normal
B	Shaft			Not Req.	Not Req.	TM-4	Not Req.	
R4A	1meg		103260	BX-69	B47-1meg-S	B11-137	TA16L	Left Channel Overload
B	Shaft			Not Req.	Not Req.	TM-4	Not Req.	

* Tape ⓐ 250K, 500K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	1meg	
R6	100K	
R7	150K	
R8	100K	
R9	4700Ω	
R10	560K	
R11	22K	
R12	15K	
R13	100K	
R14	1800Ω	
R15	100K	
R16	47K	
R17	27K	
R18	220K	
R19	3300Ω	
R20	47K	
R21	180K	
R22	100K	
R23	47K	
R24	82K	

ITEM No.	RATING	REMARKS
R25	270K	
R26	100K	
R27	100K	
R28	18Ω 2W	
R29	1meg	
R30	100K	
R31	150K	
R32	100K	
R33	4700Ω	
R34	560K	
R35	22K	
R36	15K	
R37	39K	
R38	220K	
R39	1800Ω	
R40	47K	
R41	27K	
R42	220K	
R43	3300Ω	
R44	47K	

ITEM No.	RATING	REMARKS
R45	180K	
R46	100K	
R47	47K	
R48	470Ω 1W	
R49	82K	
R50	270K	
R51	150Ω 2W	
R52	18Ω 2W	
R53	82K	
R54	82K	
R55	10K	
R56	10K	
R57	6800Ω 7W	
R58	2700Ω 2W	
R59	47K	
R60	10Ω 4W	
R61	470Ω 7W	
R62	33Ω 4W	
R63	150Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RCA Victor PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Bias Osc.	108012						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .79A	740VCT ⓐ .090A	18V ⓐ .150A	108141						
	SEC. 3	SEC. 4	SEC. 5							
	5V ⓐ 2A	6.3VCT ⓐ 2.1A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	108003	24S92	A-2935	AU-609	A-3870	24S92	S-5X	
T3	5200Ω	3-4Ω	108003	24S92	A-2935	AU-609	A-3870	24S92	S-5X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	6½"	PM	3-4Ω	106701	6A1	
SP2	3½"	PM	6-8Ω	105395	3A15TZ6.4	
SP3	3½"	PM	6-8Ω	105395	3A15TZ6.4	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	RCA Victor PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.150A	107037	B1B	1949A	304B		Selenium Type

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M2	Head	106208	Record-Playback, With Leads
M3	Head	106696	Dual Erase, With Leads
M4	Switch	107134	Off-On, Micro, (On Tape Transport)
M5	Switch	108011	Stereo-Monaural
M6	Switch	108010	Record-Playback
M7	Switch	107134	Power (Part of Transport)
M8	Switch	107103	Guide Bar Switch (Part of Tape Transport)
M9	Solenoid	107043	Record-Playback, Switch Unlatching
M10	Motor	107155	Complete (Part of Tape Transport)
	Microphone	105590	Complete

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	108013	Off-On-Loudness
Knob	108014	Balance
Knob	107041	Tone
Knob	108138	Function
Knob	108125	Record-Play
Cabinet	X4534	Complete
Handle	108015	Complete

TAPE CARTRIDGE PARTS LIST

Ref. No.	Description
1	Locking Screws
2	Cartridge Case-Side A
3	Spacer
4	Tape Hub
5	Spacer
6	Brake Spring
7	Hub Brake Slide
8	Tape Guide
9	Cartridge Case-Slide B

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1		Tape Cartridge
2	107104	Guide Bar
3	107103	Guide Bar Switch
4	107132	Pushbuttons (4)
5		Top Dress Plate
6	107057	Right-Hand Turntable and Shaft
7	107058	Left-Hand Turntable and Shaft
8	107060	Tape Hub Drive Pin
9	107059	Drive Pin Retaining Spring
10		#4 Split Lockwasher
11		#4-40 x 1/8" Long Round Head Screw
12	107098	Tape Guide Post
13	107140	#6-40 NF-2 thd. x .71" Long Record Play Head and Erase Head Adjusting Screw
14		Record-Play Head and Erase Head Mounting Bracket
15	204043	"C" Washer .145" I.D.
16	75887	.312" O.D. x .190" I.D. x .005 thk. Flat Metal Washer
17	74078	.328" O.D. x .195" I.D. x .005 thk. Cambric Washer
18	107107	Pressure Roller
19	106696	Dual Erase Head
20		#2-56 x .156" lg. Pan Head Screw
21	107147	Record-Play Head and Erase Head Adjusting Bracket
22		#6-32 x 1/4" lg. Fil. Head Screw
23	106208	Record-Play Head
24	107133	Tape Counter Escutcheon
25	107089	Tape Counter
26		#6 x 11/16" lg. Fil. Head Tapping Screw
27	107094	Tape Tensioning Head
28	107052	Motorboard
29	108177	.061" I.D. x .307" O.D x .050" thk. Retaining Ring.
30		Tape Dress Plate Mounting Screw (2)
31	204043	"C" Retainer Washer .145" I.D.
32	107106	Rewind Idler Release Pivot
33	107084	Rewind Pivot Plate Connecting Lever
34	107131	Pressure Roller Return and Cartridge Latch Return Spring
35	107095	Spacer
36	107087	Cartridge Latch Lever
37	107078	Rewind Toggle Ass'y. Operating Lever
38	107105	Take-up Idler Shift Rod
39		#8 x 1/4" lg. Hex Head Tapping Screw
40	107119	Stop Pushbutton Bracket Spring
41		Stop Pushbutton Operating Bracket
42	107063	Fast Forward Pushbutton Operating Bracket
43	107061	Rewind Pushbutton Operating Bracket
44	107062	Record-Play Pushbutton Operating Bracket
45	107124	Pushbutton Locking Slide Spring
46	107088	Pushbutton Bracket Locking Slide Lever
47	107099	Play Operating Lever Pivot Plate
48	107101	Pushbutton Pivot Lever
49	107053	Pushbutton Mounting Plate
50	107100	Pushbutton Pivot Lever Mounting Rod
51		"C" Retainer Washer .145" I.D.
52		#8 x 3/8" lg. Hex Head Tapping Screw
53	107131	Pressure Roller Return and Cartridge Latch Returning Springs (2)
54	107072	Fast Forward Actuating Lever Pivot Plate
55	74078	Cambric Washer .328" O.D x .195" I.D. x .005" thk. (2)
56	107077	Play Toggle Ass'y. Operating Lever
57		#8 x 5/8" lg. Hex Head Tapping Screw
58	108272	Felt Pressure Pad
59	107066	Pressure Pad Arm Ass'y. Mounting Bracket
60		#6 x 1/4" lg. Hex Head Tapping Screw
61	107113	Rewind Toggle Adjusting Brkt.
62	107122	Forward and Rewind Adjusting Bracket Spring
63		Flat Metal Washer .170" I.D. x .375" O.D. x .600 thk.
64		#8-32 x 3/4" lg. Hex Head Screw
65	107076	Fast Forward Actuating Lever
66	107130	Fast Forward Lever Return Spring
67	107090	Pulley Brake Release Rod
68	107054	Forward Drive Pulley
69	107056	Flywheel and Capstan Shaft Ass'y.
70	108261	Fast Forward Idler Wheel
71	107080	Take-up Idler Mounting Lever
72		Take-up Clutch Spring (.51" lg. x 5 turns x .191" O.D.)
73		#2-56 x .44" lg. Rd. Head Screw
74	108299	Take-up Clutch Ass'y.

Ref. No.	Part No.	Description
75		#8-32 x 1/4" lg. Hex Socket Set Screw
76	107144	Forward Clutch Dog
77		#8-32 x 3/4" lg. Hex Head Screw
78		Flat Metal Washer (.170" I.D. x .375" O.D. x .060 thk.)
79	107122	Forward & Rewind Adjusting Bracket Spring
80	107112	Forward Toggle Adjusting Brkt.
81		#8 x 1/4" lg. Hex Tapping Screw
82		Tape Counter Mounting Bracket
83		#6-32 x 1/4" lg. Fil. Head Screw
84		#8 x 1/4" lg. Hex Head Tapping Screw
85	107118	Pushbutton Pivot Lever Spring
86	107146	Shutoff Link Lever
87		Micro Switch Mounting Bracket
88		#8 x 1/4" lg. Hex Head Tapping Screw
89	101270	#4-40 Split Pressure Roller Adjusting Nut
90	107126	Pressure Roller Adjusting Spring
91	Part of 56	Play Toggle Ass'y. Operating Lever
92	107083	Fast Forward Link Lever
93	107067	Pressure Pad Arm Ass'y. Mounting Bracket
94	108301	Play Pivot Toggle Ass'y. Lever
95	108298	Play Pivot Toggle Spring
96	108263	Fast Forward Adjusting Stud Retainer
97	108262	Eccentric Stud
98		Fast Forward Latching Brkt.
99		#6 x 1/4" lg. Hex Head Tapping Screw
100		Rewind Idler Striker Bracket
101	107121	Shutoff Link Lever Return Spring
102		Tension Band (3.50 "lg. x .31" wide x .063" thk.)
103	107093	Tape Counter Drive Belt
104	107128	Rewind Toggle Lever Spring
105	107129	Rewind Arm Spring
106	107127	Rewind Idler Spring
107	107081	Rewind Idler Mounting Lever

Ref. No.	Part No.	Description
108	107096	Rewind Idler Lever Support Lever
109	107109	Rewind Idler Mounting Lever Retaining Pin
110	100200	#4-40 x 1/4" lg. Hex Socket Set Screw
111	107111	Rewind Clutch Dog
112	107082	Fast Forward Idler Mounting Lever
113	108261	Fast Forward Idler Wheel
114	107108	Rewind Drive Idler
115	107068	Pulley Brake Actuatior Rod
116	107070	Rewind Pulley Brake Spring with Felt Pad
117		#8 x 1/4" lg. Hex Head Tapping Screw
118	107055	Rewind Drive Pulley
119	108299	Take-up Clutch Ass'y.
120	107054	Forward Drive Pulley
121	107117	Take-up Idler Spring
122		Lock Washer
123		#8 x 1/4" lg. Hex Head Tapping Screw
124		Motor Plate Support Bracket
125	107114	Motor Mounting Plate
126		#8-32 x 5/16" lg. Hex Head Screw
127	107097	Fast Forward Idler Support Lever
128		Motor Drive Pulley
129		Set Screw
130	107091	Flywheel Drive Idler Wheel
131	107115	Fast Forward Idler Spring
132	107079	Flywheel Drive Idler Mounting Lever
133	107116	Flywheel Idler Spring
134	97179	#10-32 Hex Nut
135		Flat Metal Washer
136	103948	Motor Mounting Grommet
137	105358	Motor Mounting Spacer
138	107155	Drive Motor Complete with Pulley
139		Motor Mounting Bolts
140	101462	Motor Fan
141		#10-32 x 1/4" lg. Set Screw
142	107069	Forward Brake Spring with Felt Pad
143		#4-40 x 3/8" lg. Round Head Screw

PHOTOFACT® Folder

EIA

RIVERSIDE MODELS
FJB-6684, FJB-6687, FJB-6688

RIVERSIDE MODELS
FJB-6684, FJB-6687, FJB-6688

MODEL FJB-6684

RIVERSIDE MODELS
FJB-6684, FJB-6687, FJB-6688

TRADE NAME	Riverside Models FJB-6684, FJB-6687 (For 1959 Ford Automobiles), FJB-6688 (For 1959 Chevrolet Automobiles)
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.6 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	538 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

* Use 265KC for Pushbutton Models. Use 455KC for Manual Models.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	265KC * 455KC *	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1610KC	"	"	A5	"
3.	68mmf	High side to antenna receptacle	"	"	"	A6, A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A7 for maximum output.

PUSHBUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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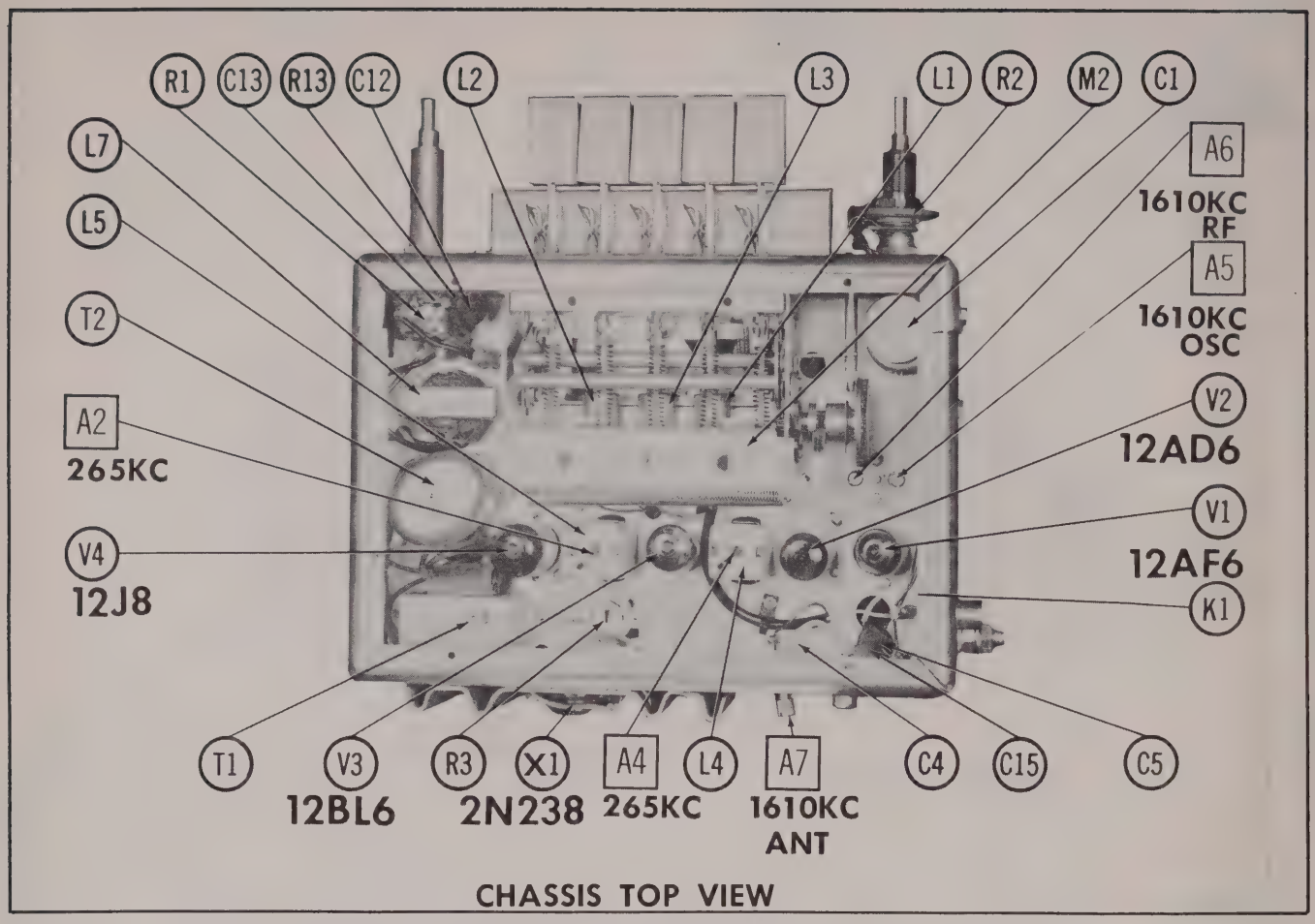
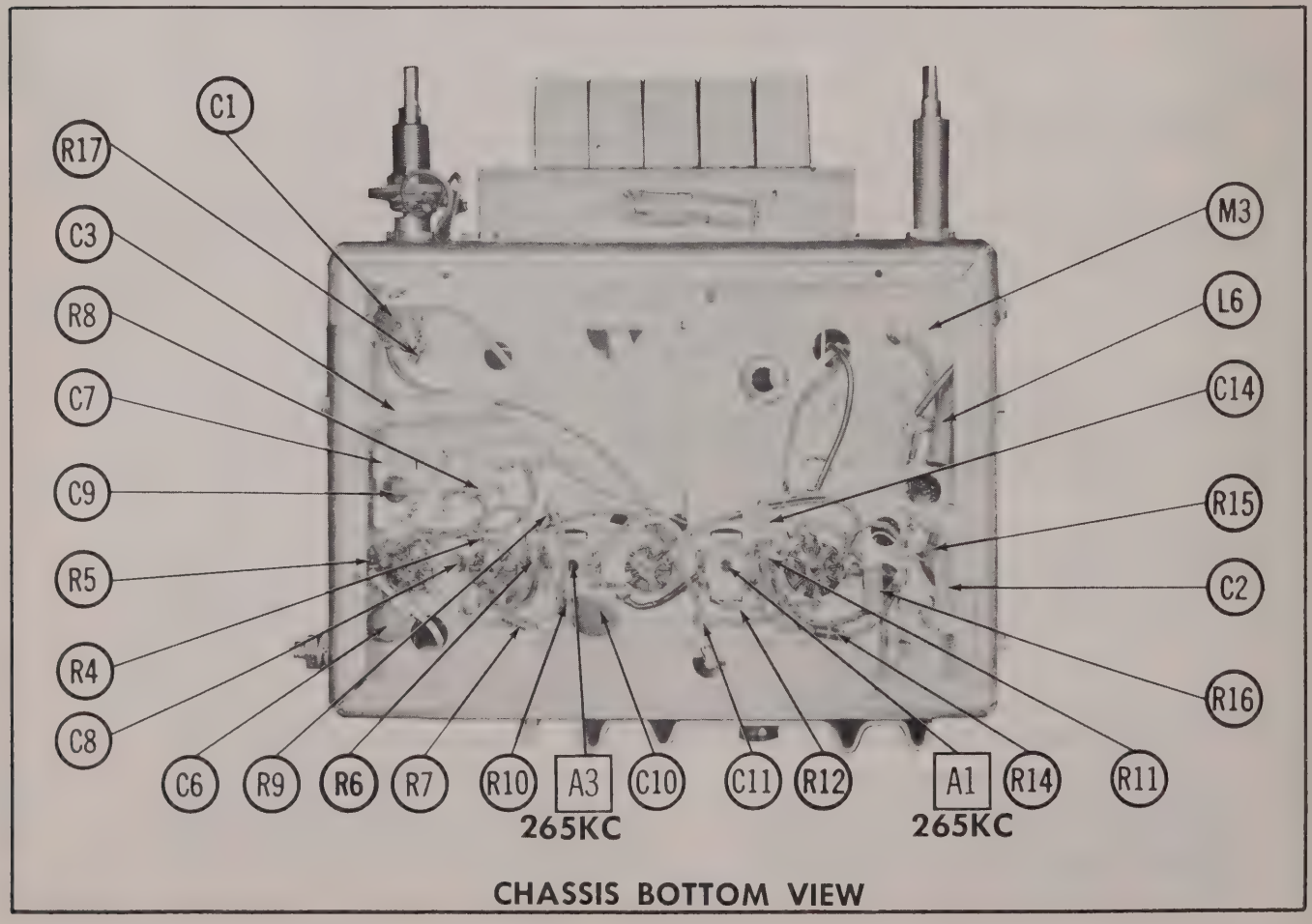
JD472

SET 469 FOLDER 16



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12AF6 (12BL6) *	V3	IF Amplifier	12BL6 (12AF6) *
V2	Converter	12AD6	V4	Det. - AVC - AF Amp.	12J8 (12DL8) *

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	2N238 ①	Output				2N407	PNP

① Some versions may use 2N236 or CTI124.
When replacing transistor, apply Silicone Grease (General Cement Z5 or equivalent) between transistor and chassis.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RIVERSIDE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲150	15	20-315	PWH2-02-75	B0095	PETA190		TVLS-2155 *	
B	■500	15							
C2	750	3	20-757	SRE3V500	BBR1000-6	WP200.5		TVAS-1097 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.1 200V	①	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C4		#28-800K						
C5	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C6	3000		DI-3000	DD-302	BYA10D3	CCD-302	UC-523	5GA-D30
C7A								
B		#28-4046						
C	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C8	27	(12mmf) *②	NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C9	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	27		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C12	3000		DI-3000	DD-302	BYA10D3	CCD-302	UC-523	5HK-D30
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	3000		DI-3000	DD-302	BYA10D3	CCD-302	UC-523	5HK-D30

\# Riverside Part Number. * Alternate Value.
① Some versions may use .047mfd in this application.
② Some versions may use 12mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RIVERSIDE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	80A618B ①					Tone
B	1meg	½			RTV-681C	■ QJ-993A	▲ UE3981-S	Volume, Tap ② 650K
C	Switch							Power Off-On
R2	25Ω	2(WW)	80A833 ②					Speaker Fader
R3	500Ω	2(WW)	62-501		39-500-100	112-500-100	FL-600S	Bias

■ "Concentrikit" Equivalent: K-8 Kit with base elements and shafts: B13-139, P13-128 (Panel)
B19-137X, R1-207 (Rear)
S-50 (Bushing)
76-1 (Switch)

▲ "STA-LOC" Equivalent: FL26A, RU16T654, OS1937, IS2375, US41.
① Model FJB-6688 uses Part #80A1070.
② Some versions may use Part #80A233. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1500Ω	
R5	150K	
R6	4.7meg	
R7	2.2meg	
R8	47K	

ITEM No.	RATING	REMARKS
R9	10meg	
R10	10meg	
R11	1.2meg	
R12	47K	
R13	100K	

ITEM No.	RATING	REMARKS
R14	10meg	(3.3meg) *
R15	22Ω	
R16	1Ω 1W	
R17	68Ω	

* Alternate

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RIVERSIDE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Antenna Coil	†						
L2	RF Coil	†						
L3	Osc. Coil	†						
L4	Input IF	14-265	16-6752	16-6752	BC-350	12-H1	RF-3	①
L5	Output IF	14-267	16-6754	16-6754	BC-354	12-H6		②
L6	"A" Lead Choke							9.7uh

† Part of M2.
① Models FJB-6687 & FJB-6688 use Part #14-1655.
② Models FJB-6687 & FJB-6688 use Part #14-1656.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	1.6A	.9Ω	.008 Hy.	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	8	1	75A702C ①						① Alternate Part #75-459.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	22Ω Tap ② 3-4Ω	75A966 ①							

① Alternate Part #75-966. Model FJB-6688 uses Part #75-460.

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA RIVERSIDE PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	3-4Ω	73B902 ①	69A3	① Models FJB-6684, FJB-6687
	6" x 9"	PM	3-4Ω	73B1083 ②		② Model FJB-6688

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RIVERSIDE PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg	89-4204	Centralab PC-50 Sprague PRC-9

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA RIVERSIDE PART No. FUSE	RIVERSIDE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	SFE	7½A 32V		-	30707.5 (7½A 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	RIVERSIDE PART No.	NOTES
M2	Tuner	78B1061/1062	Pushbutton, Model FJB-6684
	Tuner	78A915	Manual, Model FJB-6687
	Tuner	78BA1089	Manual, Model FJB-6688
M3	Spark Plate		

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

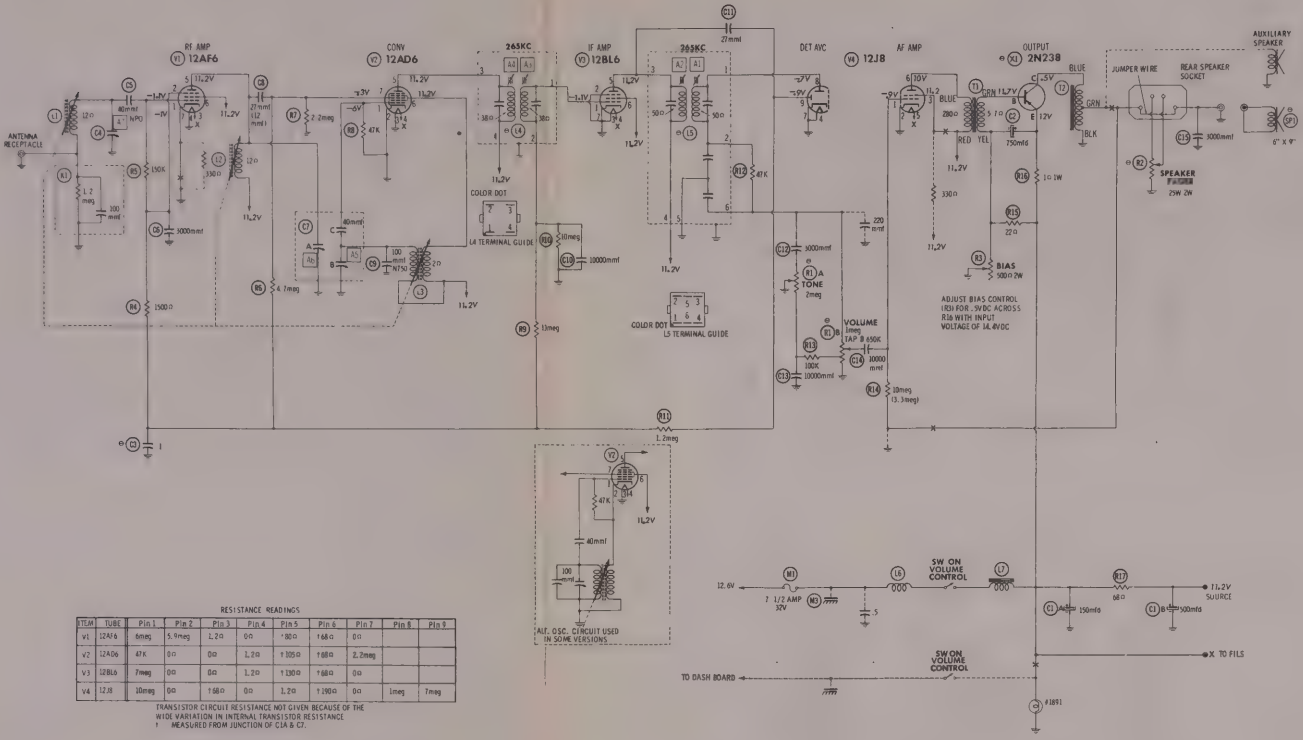
NAME	PART NO.	DESCRIPTION
Escutcheon	54C1060	Model FJB-6684
Escutcheon	54C1060-1	Model FJB-6687
Escutcheon	54C1075	Model FJB-6688
Knob	47-A617	Control, Model FJB-6684, FJB-6687
Knob	48-A1069	Control & Tuning, Model FJB-6688
Knob	48B393	Tone, Model FJB-6684, FJB-6687
Knob	48B393-1	Dummy, Model FJB-6684, FJB-6687
Knob	48A1063	Tone & Dummy, Model 6688

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Shielded Hook-up Wire ..... Use BELDEN No. 8885

Bonding Strap ..... Use BELDEN No. 8661



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AF6	6meg	5.9meg	1.2Ω	0Ω	†80Ω	†68Ω	0Ω		
V2	12AD6	47K	0Ω	0Ω	1.2Ω	†105Ω	†68Ω	2.2meg		
V3	12BL6	7meg	0Ω	0Ω	1.2Ω	†130Ω	†68Ω	0Ω		
V4	12J8	10meg	0Ω	†68Ω	0Ω	1.2Ω	†190Ω	0Ω	1meg	7meg

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
† MEASURED FROM JUNCTION OF C1A & C7.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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RIVERSIDE MODELS
FJB-6684, FJB-6687, FJB-6688

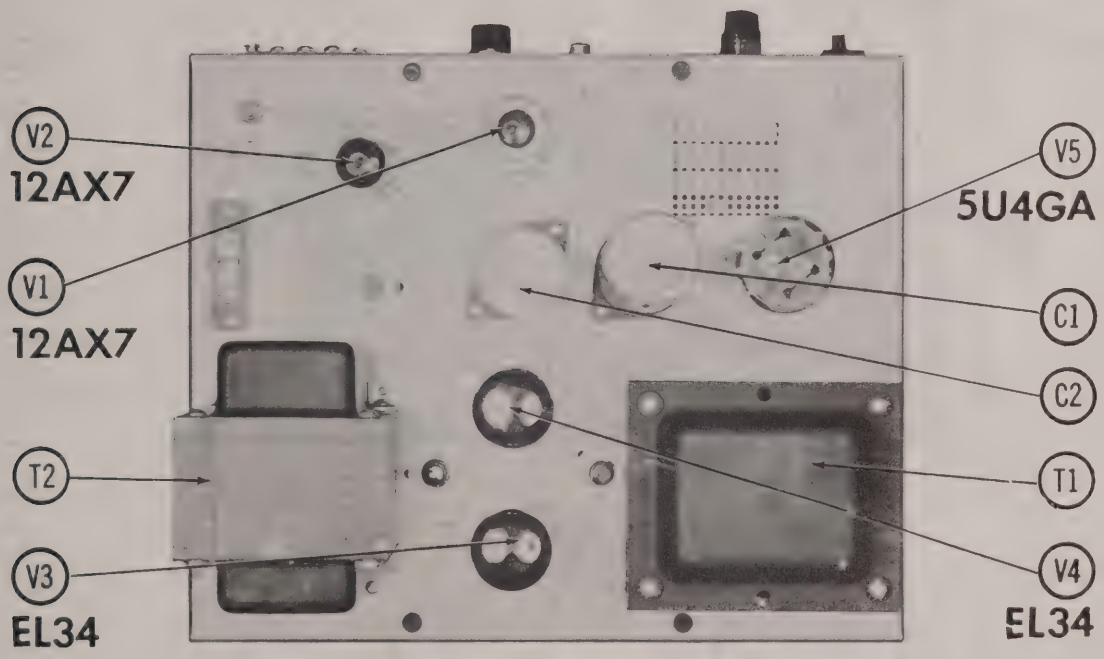
PHOTOFACT® Folder

H. H. SCOTT
MODEL 250

H. H. SCOTT
MODEL 250

TRADE NAME	H. H. Scott Model 250
MANUFACTURER	Hermon Hosmer Scott, Inc., 111 Powder Mill Road, Maynard, Mass.
TYPE SET	AC Operated 5 Tube Audio Amplifier
POWER SUPPLY	105-120 Volts AC, 50-60 Cycles RATING 126 Watts, 1.28 Amp. @117 Volts AC (No Signal)

H. H. SCOTT
MODEL 250



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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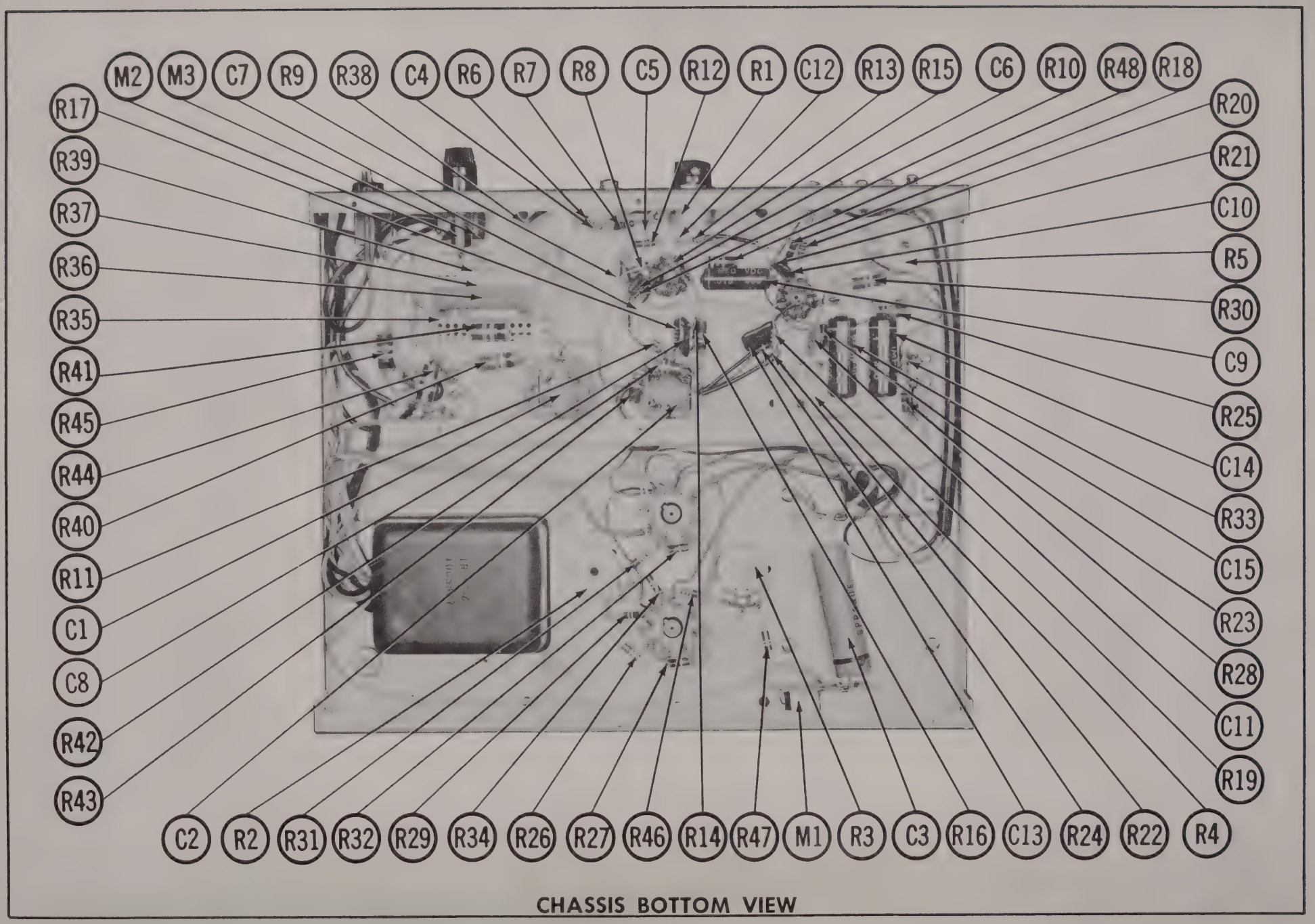


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	12AX7	V4	Output	EL34/6CA7
V2	AF Amp. -Phase Inv.	12AX7	V5	Rectifier	5U4GA
V3	Output	EL34/6CA7			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350							①
B	▲40	350							①
C2A	▲20	475	CEC-4X20/475	AFH4-19-20	D0179.5	FP475	TMQ-12	TVL-4834	
B	■20	475							
C	▲20	475							
D	20	475							
C3	50	100	CET-50/100	PRS150V50	BR5015	TC49	TD-50-150	TVA-1414	

① Some versions may use 40-40mfd ⓐ 300V in this application (Part #CEC-2X40/300).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	8.2		NPO-SI 8.2		C10V82C		C10V82C	10TCC-V82
C5	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C6	330 10%		1468-00033K	D6-331	22R5T33	CCS-331	JL-333	MS-333
C7	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C8	820 10%		1468-00082K	DD-821	1R5T82	CM-20B-821K	JL-382	MS-382
C9	.015 400V		P488N-015	DD16-153	CUB6S15	4DP-1-153	GEM-4115	6TM-S15
C10	47		1468-000047	D6-470	22R5Q47	CM-20B-470M	CNO-447	MS-447
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S2
C12	5		DI-5	DD-050	C10V5C	CCD-050	ZT-555	5GA-V50
C13	680 10%		1468-00068K	D6-680	1R5T68	CM-20B-681K	JL-368	MS-368
C14	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C15	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100K	½	RCV-100K-3S	BX-40	A47-100K-S	Q11-128	U41	Input Level
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R2A	50K	½	RCV-50K-P	BX-31	A47-50K-S	Q11-123	U35	DC Balance
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R3A	10K	½	RCV-10K-S	AB-14	A47-10K-S	Q11-116	U20	Bias Note 1
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R4A	100K	½	RCV-100K-3S	BX-40	A47-100K-S	Q11-128	U41	AC Balance
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R5A	500Ω	½	RCV-500-P	AB-4	A47-500-S	Q11-103	U2	Hum Adjust
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

Note 1. Some versions may use 1W (Part #RCV-10K-P).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	330K	
R7	47K	
R8	10K	
R9	2.2meg	
R10	220K	
R11	47K	
R12	5600Ω	
R13	470K	
R14	2.2meg	
R15	330K	
R16	100K 1W	
R17	2700Ω	
R18	1meg	
R19	270K	
R20	1800Ω	
R21	6800Ω	
R22	2.2meg	
R23	220K	
R24	1500Ω	
R25	100K 1W	
R26	390K	

RESISTORS (cont)

ITEM No.	RATING	REMARKS
R27	1000Ω	
R28	27Ω	Note 1
R29	150K	
R30	100K	
R31	390K	
R32	1000Ω	
R33	27Ω	Note 1
R34	150K	
R35	750Ω 10W	
R36	25K 10W	
R37	1200Ω 10W	
R38	1meg	
R39	33Ω 10W	#RW10-33
R40	100K 2W	(270K) *
R41	100K 2W	(270K) *
R42	47K 1W	
R43	4700Ω 1W	
R44	100K 2W	
R45	10K 2W	
R46	39K	
R47	15K	
R48	3.3Ω 1W	

H. H. Scott Part Number.
Note 1. R28 & R33 are a matched pair.
* Alternate.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA H. H. SCOTT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.28A	860 VCT ⓐ .150A Tap ⓐ 105V ⓐ .0015A	5V ⓐ 3A	TR-12-4						
	SEC. 3 6.3V ⓐ 3.6A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA H. H. SCOTT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4400Ω CT	16Ω Taps ⓐ 8Ω, 4Ω	TRA-10-16							

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA H. H. SCOTT PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.0015A	SR-130/10 ①	D-5410 ①	1159 ①	10 ①		① Selenium Type

FUSES

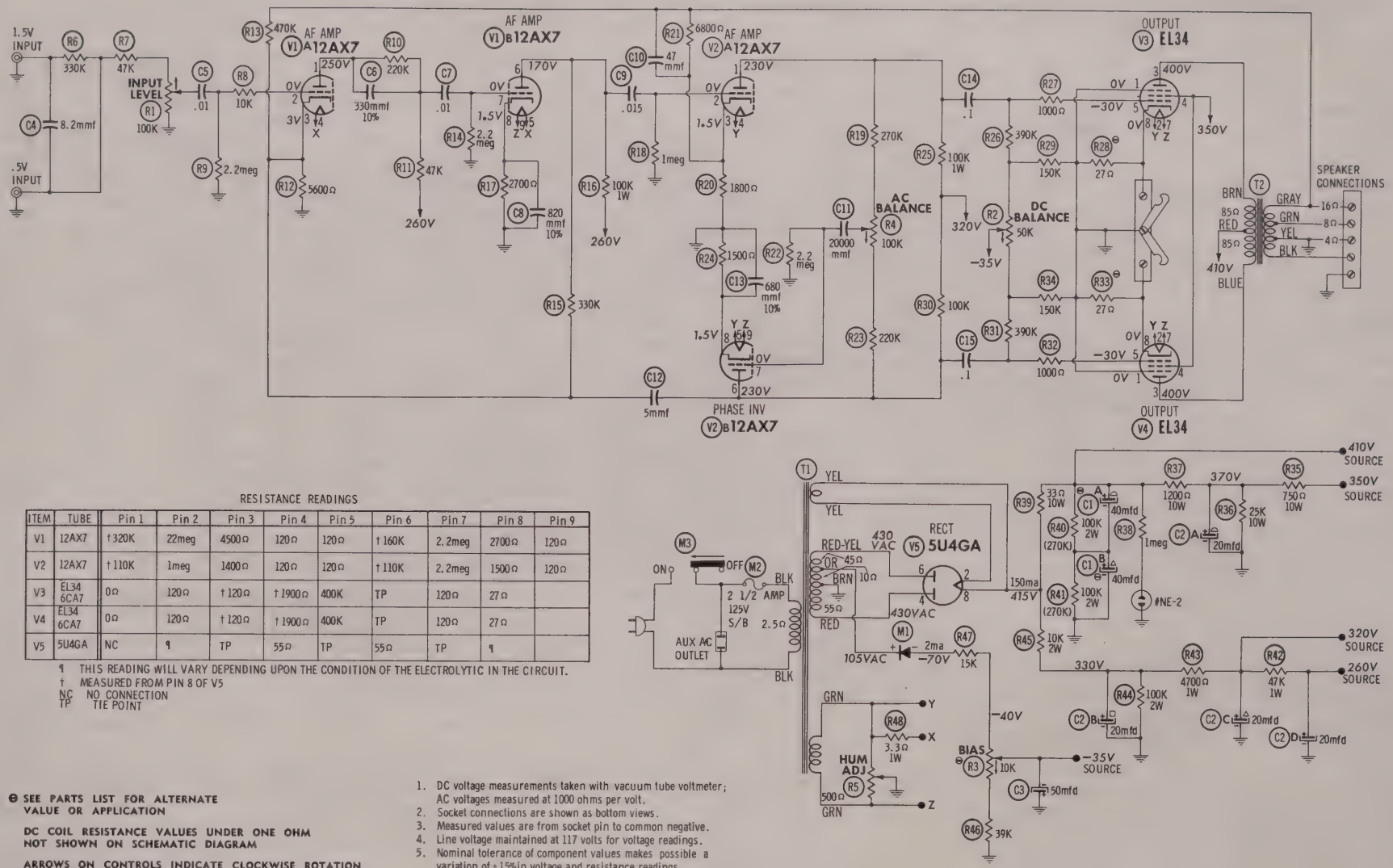
ITEM No.	TYPE	RATING	REPLACEMENT DATA H. H. SCOTT PART No. FUSE	H. H. SCOTT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	MDL	2½A 125V S/B			31302.5 (MDL-2½A 125V S/B)	342001	MDL2½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	H. H. SCOTT PART No.	NOTES
M3	Switch	SS-12	Off-On (SPST, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†320K	22meg	4500Ω	120Ω	120Ω	†160K	2.2meg	2700Ω	120Ω
V2	12AX7	†110K	1meg	1400Ω	120Ω	120Ω	†110K	2.2meg	1500Ω	120Ω
V3	EL34 6CA7	0Ω	120Ω	†120Ω	†1900Ω	400K	TP	120Ω	27Ω	
V4	EL34 6CA7	0Ω	120Ω	†120Ω	†1900Ω	400K	TP	120Ω	27Ω	
V5	5U4GA	NC	¶	TP	55Ω	TP	55Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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H. H. SCOTT
MODEL 250

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SHERWOOD MODEL S-1060

SHERWOOD
MODEL S-1060

SHERWOOD
MODEL S-1060

TRADE NAME	Sherwood Model S-1060
MANUFACTURER	Sherwood Electronic Laboratories, Inc., 4300 N. California Ave., Chicago 18, Illinois
TYPE SET	AC Operated 10 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 130 Watts, 1.35 Amp. @ 117 Volts AC

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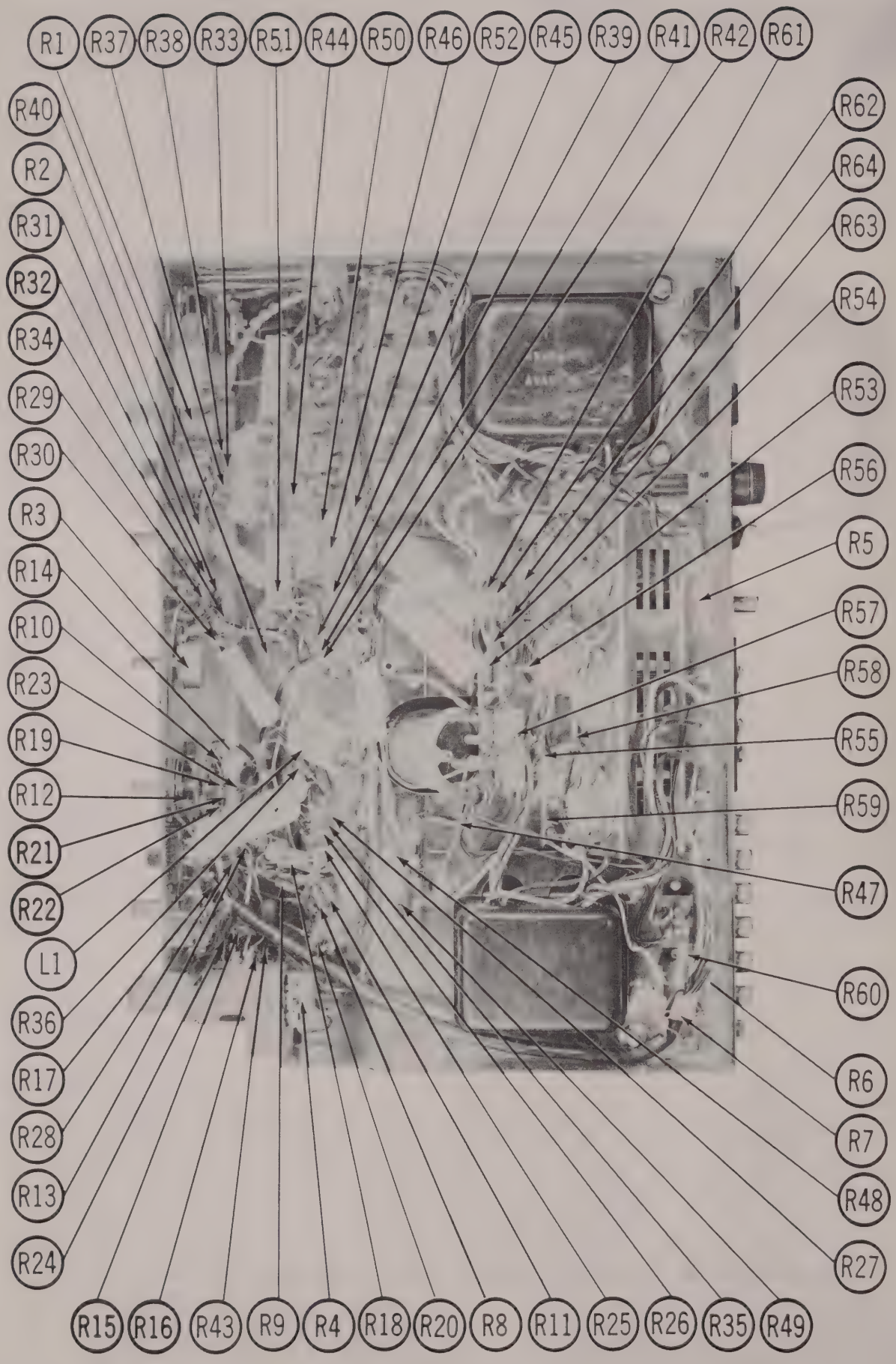
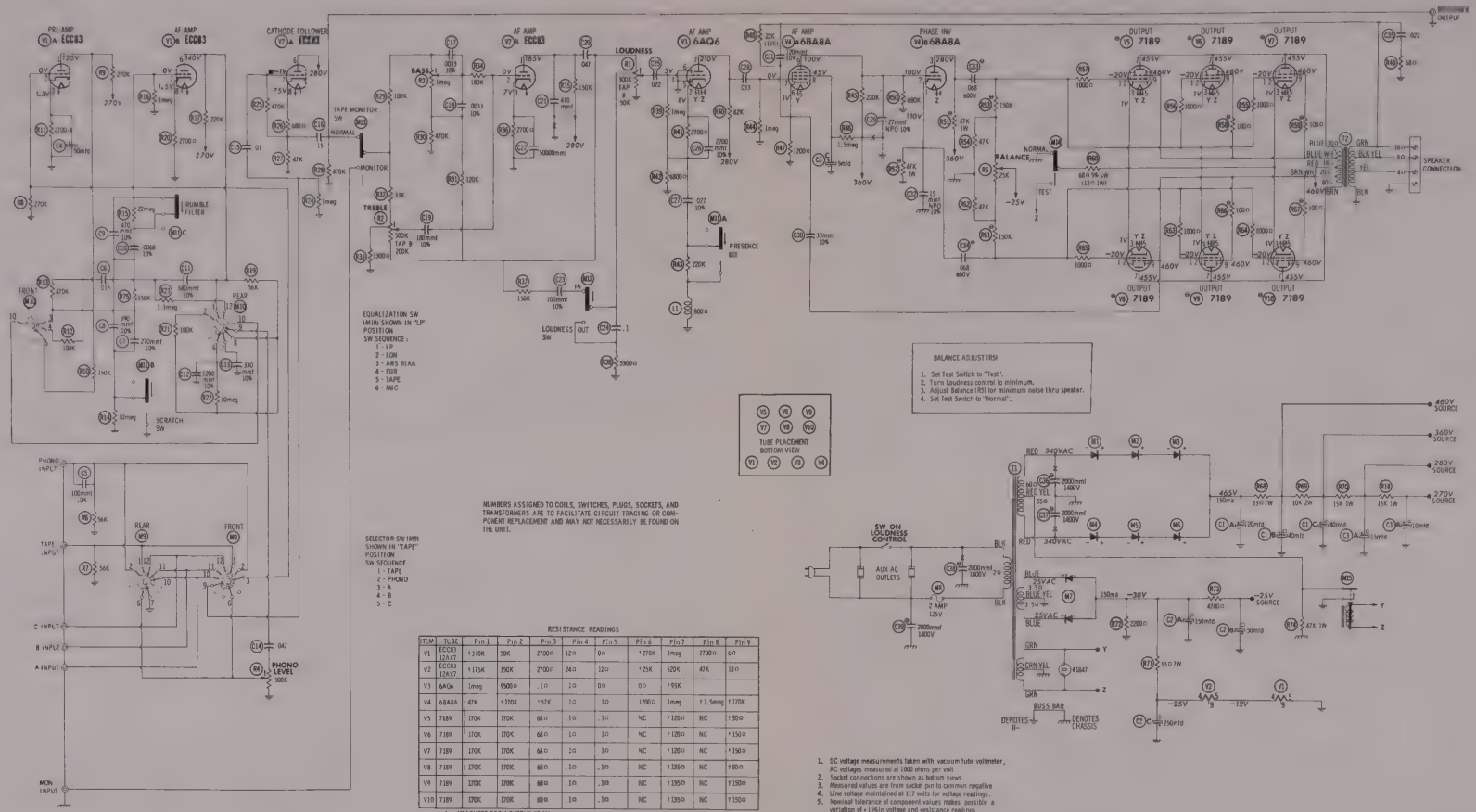
SET 469 FOLDER 18



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



TUBE PLACEMENT BOTTOM VIEW

BALANCE ADJUST IRSH

1. Set Test Switch to "Test".
2. Turn Loudness control to minimum.
3. Adjust Balance (R5) for minimum noise thru speaker.
4. Set Test Switch to "Normal".

EQUALIZATION SW (MIDI SHOWN IN "LP" POSITION
SW SEQUENCE:
1 - LP
2 - LON
3 - AES RIAA
4 - EUR
5 - TAPE
6 - MAC

SELECTOR SW (MM SHOWN IN "TAPE" POSITION
SW SEQUENCE
1 - TAPE
2 - PHONO
3 - A
4 - B
5 - C

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†310K	50K	270Ω	12Ω	0Ω	†270K	1meg	270Ω	6Ω
V2	ECC83 12AX7	†175K	350K	270Ω	24Ω	12Ω	†25K	520K	47K	18Ω
V3	6AQ6	1meg	9500Ω	.1Ω	2Ω	0Ω	0Ω	†95K		
V4	6BA8A	47K	†170K	†57K	1Ω	1Ω	1200Ω	1meg	†1.5meg	†170K
V5	7189	170K	170K	68Ω	.1Ω	.1Ω	NC	†120Ω	NC	†50Ω
V6	7189	170K	170K	68Ω	1Ω	1Ω	NC	†120Ω	NC	†150Ω
V7	7189	170K	170K	68Ω	1Ω	1Ω	NC	†120Ω	NC	†150Ω
V8	7189	170K	170K	68Ω	.1Ω	.1Ω	NC	†135Ω	NC	†50Ω
V9	7189	170K	170K	68Ω	.1Ω	.1Ω	NC	†135Ω	NC	†150Ω
V10	7189	170K	170K	68Ω	.1Ω	.1Ω	NC	†135Ω	NC	†150Ω

† MEASURED FROM OUTPUT OF M6
• MEASURED FROM PIN 8 OF V2.
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

@ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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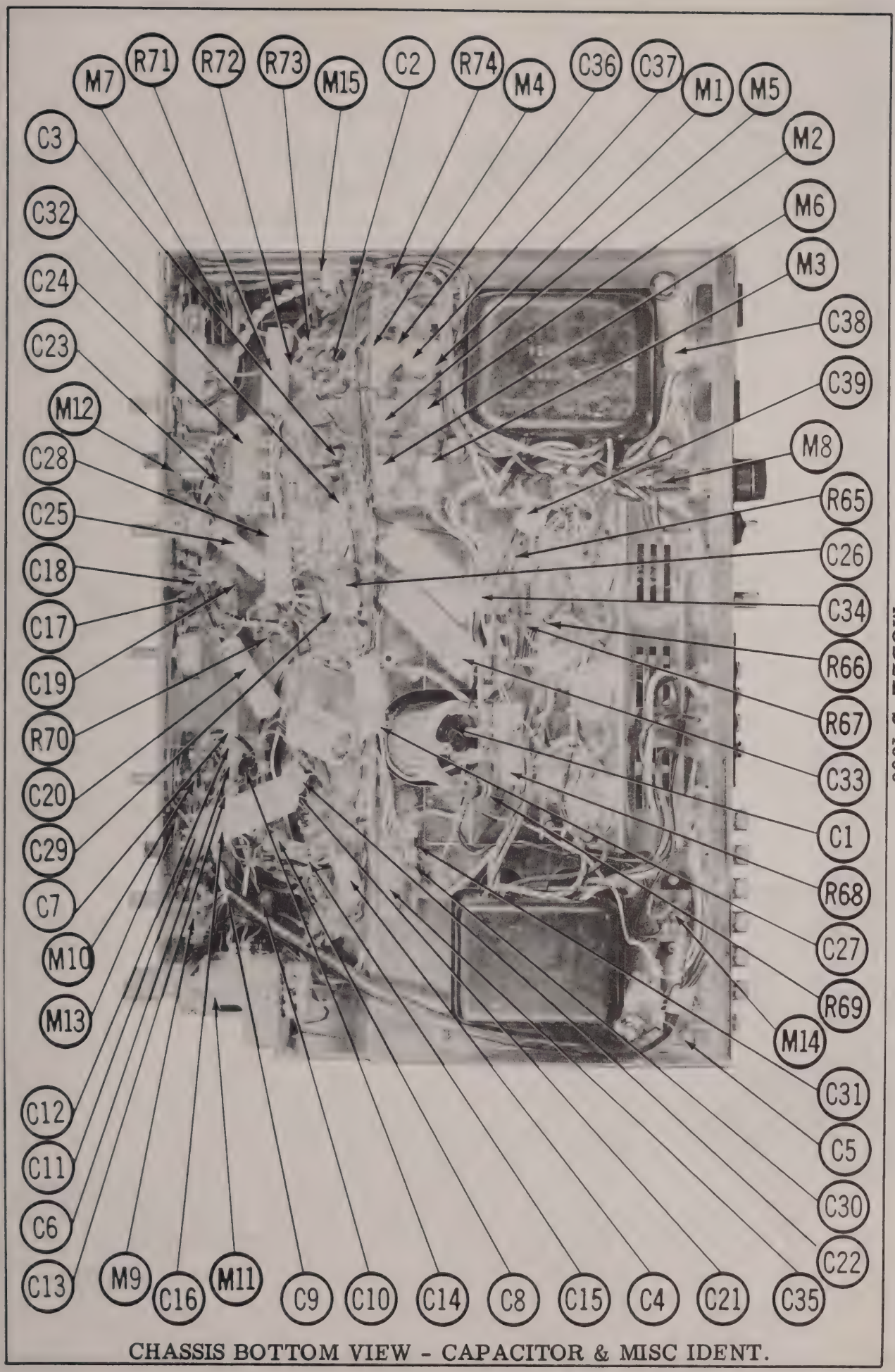
SHERWOOD
MODEL S-1060



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.

SHERWOOD
MODEL S-1060

FOLDER 18

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Preamp. -AF Amp.	ECC83/12AX7	V6	Output	7189 (6BQ5B)*
V2	Cathode Follower-AF Amp.	ECC83/12AX7	V7	Output	7189 (6BQ5B)*
V3	AF Amp.	6AQ6	V8	Output	7189 (6BQ5B)*
V4	AF Amp. -Phase Inv.	6BA8A	V9	Output	7189 (6BQ5B)*
V5	Output	7189 (6BQ5B) *	V10	Output	7189 (6BQ5B)*

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SHERWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▂20	500	120AB4-4	AFH3-54	D0185	FP288		TVLS-3966 *	
B	■40	500				TC83			
C	▲40	500							
C2A	▂150	50	120AB6-8					TVLS-3340 *	
B	■50	50							
C	▲250	50							
C3A	■15	400	120B8		B0290		TMD-41	TVLS-3586.2*	
B	10	400			BBR4-250		TD-4-450		
C	5	250							
C4	50	6	CE8506	PWE6050	NL50-6	TT6X50	ML50-6	TVA-1100	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA SHERWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	100		10%		1469-0001	DD-101	22R5T1	MCB235	MS-31	
C6	.015	400			P488N-015		CUB6S15	GEM-4115	4TM-S15	
C7	270		10%		DI-270	MD-271	L10T27		5GA-T27S 10%*	
C8	390		10%		DI-390	MD-391	L10T39		5GA-T39S 10%*	
C9	470		10%		DI-470	MD-471	225T47	JL-347	5GA-T47S 10%*	
C10	.0068	400	10%		V84C4D68		PM6D68	GTM4268	6TM-D68	
C11	680		10%		DI-680	MD-681	1R5T68	JL-368	5GA-T68S 10%*	
C12	1200		10%		DI-1200		1R5D12	JL-212	5GA-D12S 10%*	
C13	330		10%		DI-330	MD-331	L10T33	JL-333	5GA-T33S 10%*	
C14	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C15	.01	400			P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C16	.15	200			P288N-15		CUB2P15	GEM-2015	2TM-P15	
C17	.0033	400	10%		V84C4D33		PM4D33	GTM4233	6TM-D33	
C18	.0033	400	10%		V84C4D33		PM4D33	GTM4233	6TM-D33	
C19	180		10%		1469-00018	MD-181	22R5T18		MS-318	
C20	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C21	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C22	50000				BPD-05	DF-503	H-05S5	TA-250	TG-S50	
C23	100		10%		DI-100	DD-101	22R5T1	MCB235	MS-31	
C24	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C25	.022	400			P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C26	2200		10%		DI-2200		PM6D22	JL-222	5GA-D22S 10%*	
C27	.027	400	10%		P684CM-027				5BF-S27	
C28	.033	400			P488N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C29	27		NPO 10%			TCZ-27	C10Q27	CNO-427	5TCC-Q27S 10%*	
C30	33		10%		1469-000033	DD-330	L10Q33	CNO-433	MS-433	
C31	120		10%		1469-00012	DD-121	L10T12	CNO-312	MS-312	
C32	15		NPO 10%		NPO-DI 15	DTZ-15	C10Q15	CNO-415	5TCC-Q15S 10%*	
C33	.068	600			P688N-068		CUB6S68	GEM-6168	6TM-S68	Note 1
C34	.068	600			P688N-068		CUB6S68	GEM-6168	6TM-S68	Note 1
C35	.022	400			P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C36	2000	1400			HVD-15-2200	DD30-202	HVC16D2	2HV-222	20HK-D2S *	Note 2

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA SHERWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C37	2000	1400			HVD-15-2200	DD30-202	HVC16D2	2HV-222	20HK-D2S *	Note 2
C38	2000	1400			HVD-15-2200	DD30-202	HVC16D2	2HV-222	20HK-D2S *	Note 3
C39	2000	1400			HVD-15-2200	DD30-202	HVC16D2	2HV-222	20HK-D2S *	Note 3

Note 1. Matched pair within 3%
Note 2. Not used in some versions.
Note 3. When C38 is not used, C39 is 5000mmf.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SHERWOOD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	300K	½	A671B4	BT-57	A47F1-350K	Q18-132X	UT-425	Loudness, Tap@50K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	
R2A	500K	½	671AB1	BT-65	A47F5-500K	Q19-133X	UT-431	Treble, Tap@200K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	670AB2	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4	500K	⅓	670AB7				TA55A †	Phono Level
R5A	25K	⅓	A670B8	AB-26	B47-25K-S	B11-120	TA253L	Balance
B	Shaft			AK-1	Not Req.	TM1	Not Req.	

† File or grind shaft to duplicate original.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	56K	
R7	56K	
R8	270K	
R9	270K	
R10	150K	
R11	2700Ω	
R12	100K	
R13	470K	
R14	10meg	
R15	22meg	
R16	1meg	
R17	220K	
R18	15K 1W	
R19	56K	
R20	2700Ω	
R21	100K	
R22	10meg	
R23	3.3meg	
R24	1meg	
R25	470K	
R26	680Ω	
R27	47K	
R28	470K	

ITEM No.	RATING	REMARKS
R29	100K	
R30	470K	
R31	120K	
R32	33K	
R33	3300Ω	
R34	180K	
R35	150K	
R36	2700Ω	
R37	150K	
R38	3300Ω	
R39	1meg	
R40	82K	
R41	2700Ω	
R42	6800Ω	
R43	220K	
R44	1meg	
R45	220K	
R46	1.5meg	
R47	1200Ω	
R48	22K	(18K)*
R49	68Ω	
R50	680K	
R51	47K 1W	Note 1

ITEM No.	RATING	REMARKS
R52	47K 1W	Note 1
R53	150K	Note 2
R54	47K	
R55	1000Ω	
R56	1000Ω	
R57	1000Ω	
R58	100Ω	Note 3
R59	100Ω	Note 3
R60	68Ω 5% 1W	(12Ω)*
R61	150K	Note 2
R62	47K	
R63	1000Ω	
R64	1000Ω	
R65	1000Ω	
R66	100Ω	Note 3
R67	100Ω	Note 3
R68	33Ω 7W	
R69	10K 2W	
R70	15K 1W	
R71	33Ω 7W	
R72	2200Ω	
R73	4700Ω	
R74	47K 1W	
R75	150K	

Note 1. R51 & R52 Matched Within 3%.
Note 2. R53 & R61 Matched Within 3%.
Note 3. Not used in some versions.
* Alternate

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SHERWOOD PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Tone Choke	56-507						140MH

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
				SHERWOOD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	117V ⓐ 1.35A	680 VCT ⓐ .170A	52 VCT ⓐ .170A	B922B3						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT ⓐ 5.6A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SHERWOOD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2900Ω CT Screen Taps ⓐ 150Ω CT	16Ω Taps ⓐ 8Ω, 4Ω	B920B3							

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SHERWOOD PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.150	①	SD-92 ①	HA504 ①	K200 ①	SR200 ①	① Silicon
M2	.150	①	SD-92 ①	HA504 ①	K200 ①	SR200 ①	② Selenium
M3	.150	①	SD-92 ①	HA504 ①	K200 ①	SR200 ①	
M4	.150	①	SD-92 ①	HA504 ①	K200 ①	SR200 ①	
M5	.150	①	SD-92 ①	HA504 ①	K200 ①	SR200 ①	
M6	.150	①	SD-92 ①	HA504 ①	K200 ①	SR200 ①	
M7	.146A	②					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SHERWOOD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M8	3AG	2A 125V			312002. (3AG 2A 125V)	342001	AGC 3	HKP

MISCELLANEOUS

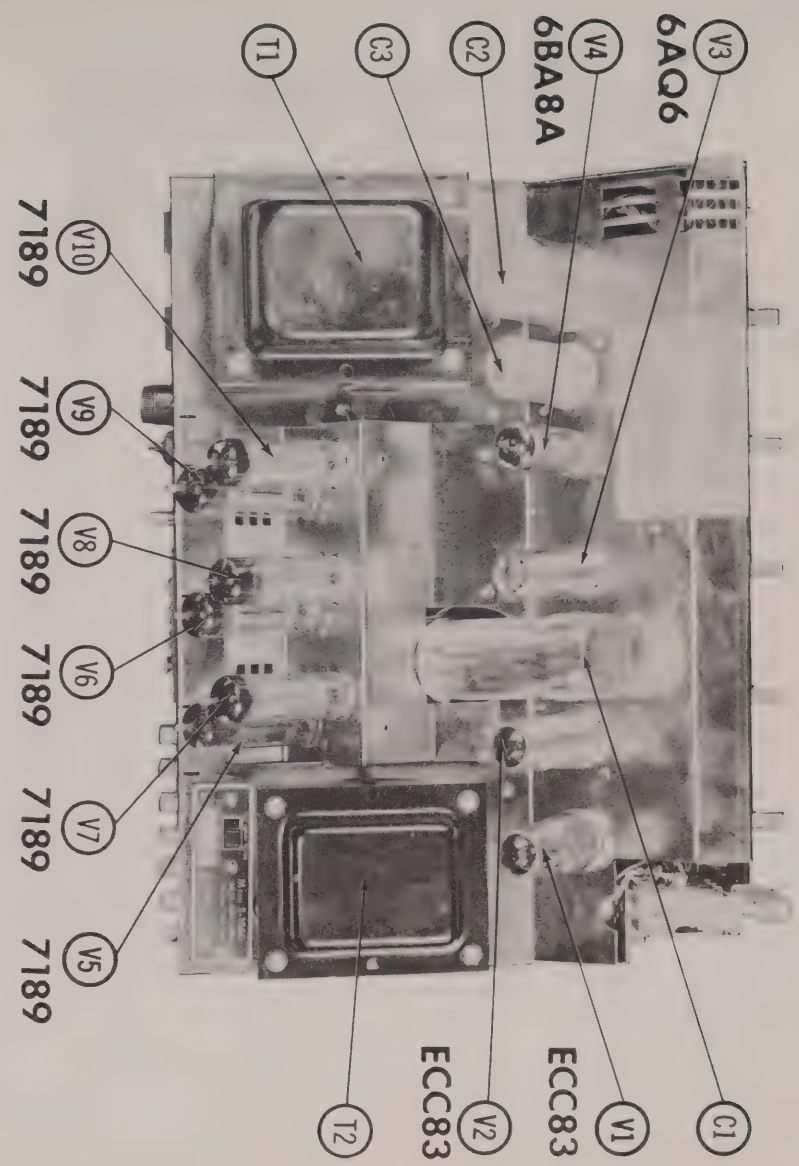
ITEM No.	PART NAME	SHERWOOD PART No.	NOTES
M9	Switch		Selector
M10	Switch		Equalization
M11A	Switch		Presence
B	Switch		Scratch Filter
C	Switch		Rumble Filter
M12	Switch		Loudness, (SPDT, Slide Type)
M13	Switch		Normal-Monaural (SPDT, Slide Type)
M14	Switch		Output Tube Balance, (SPDT, Slide Type)
M15	Thermal Switch		

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE
MODEL 217 (Ch. 528.53650)

SILVERTONE
MODEL 217 (Ch. 528.53650)

SILVERTONE
MODEL 217 (Ch. 528.53650)

TRADE NAME	Silvertone Model 217 (Ch. 528.53650)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535-1630KC
RATING	5.7MA @ 9 Volts DC (No Signal, Min. Volume) 15MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1, A2, A3 ... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

A4, A5 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A6 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to base of Converter. Low side to chassis.	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.	"	"	1630KC	"	"	A4	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang.
4.		"	600KC	Tune to 600KC signal	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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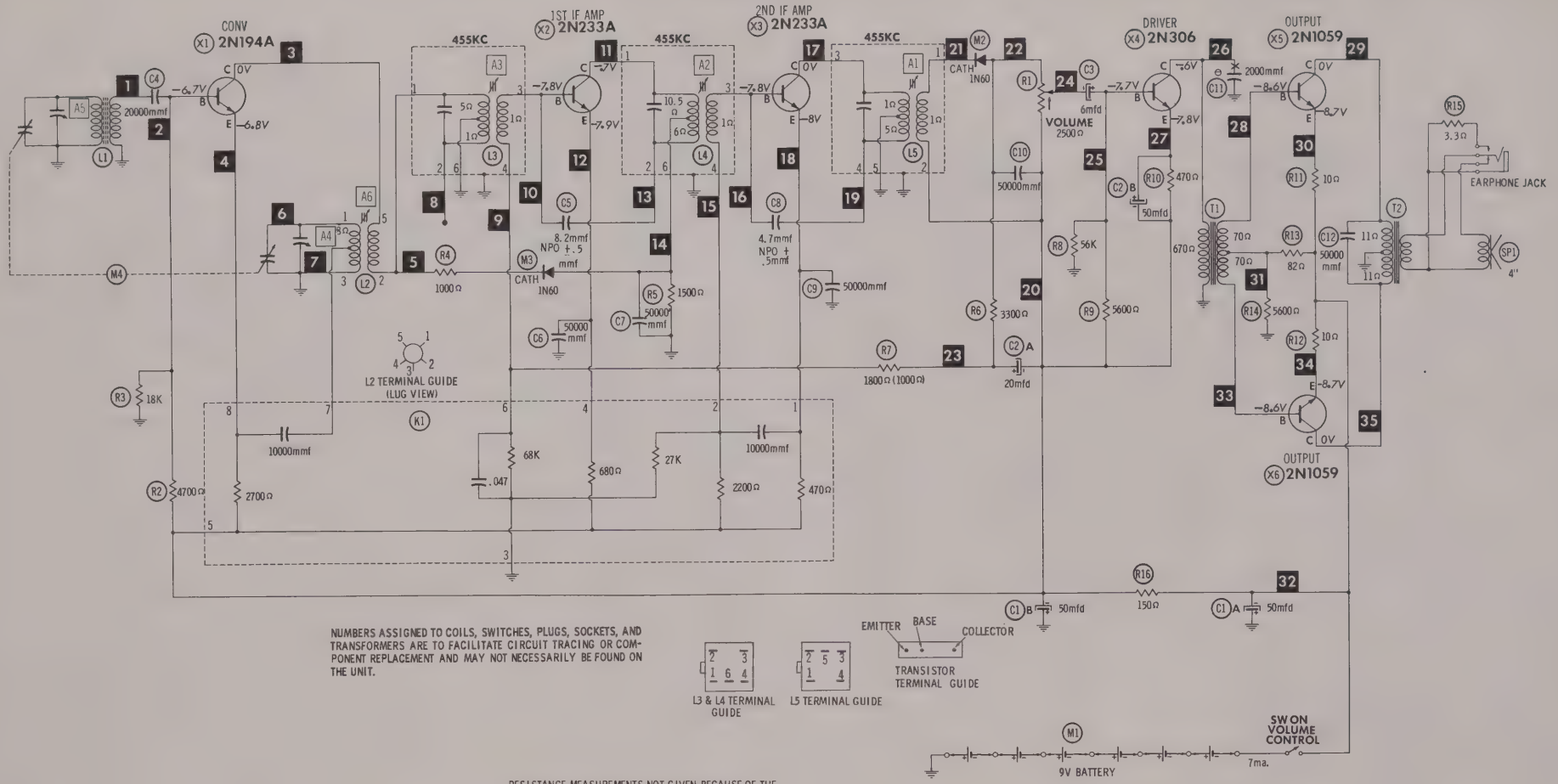
JF552

SET 469 FOLDER 19



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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SILVERTONE
MODEL 217 (Ch. 528.53650)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter	2N438			2N194A	NPN
X2	2N233A	1st IF Amp.	2N438			2N233A	NPN
X3	2N233A	2nd IF Amp.	2N438			2N233A	NPN
X4	2N306	Driver	2N306	2N647		2N306	NPN
X5	2N1059	Output	2N438A	2N647		2N1059	NPN } Matched Pair
X6	2N1059	Output	2N438A	2N647		2N1059	NPN }

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	50	10	18-96-5	BCD10X5030					
B	50	10							
C2A	20	10	18-97-5	BCD10X5030				VLS-2245*	
B	50	10							
C3	6	15	18-84-5	XPP-15006	EC6-25	TT25X5	ML6-15	TE-1153	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	8.2 NPO ±.5mmf		NPO-DI 8.2		C10V82C		CNO-582	10TCC-V82
C6	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C7	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C8	4.7 NPO ±.5mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C9	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C10	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C11	2000	①	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C12	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	½	24-356-0					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4700Ω	
R3	18K	
R4	1000Ω	
R5	1500Ω	
R6	3300Ω	

ITEM No.	RATING	REMARKS
R7	1800Ω	(1000Ω)*
R8	56K	
R9	5600Ω	
R10	470Ω	
R11	10Ω	

ITEM No.	RATING	REMARKS
R12	10Ω	
R13	82Ω	
R14	5600Ω	
R15	3.3Ω	
R16	150Ω	

* Alternate.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No.	
L1	Loopstick	82-153-0						
L2	Osc. Coil	10-53-4						
L3	1st IF Trans.	10-113-2						
L4	2nd IF Trans.	10-114-2						
L5	3rd IF Trans.	10-115-2						

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	80-102-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω CT	3-4Ω	80-101-1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	33-413-4 ①	4A05	① Includes T2

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	RF•IF Bias Network	10000mmf, 10000mmf, .047mfd, 470Ω, 680Ω, 2200Ω, 2700Ω, 27K, 68K	13-34-3	

BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	6446		130		635		M-14R	6 Required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	1N60	Detector (Pigtail)
M3	1N60		1N60	1N60	1N60	AVC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning Cap. Printed Board	19-83-2 25-20-1	2 Gang

CABINETS & CABINET PARTS

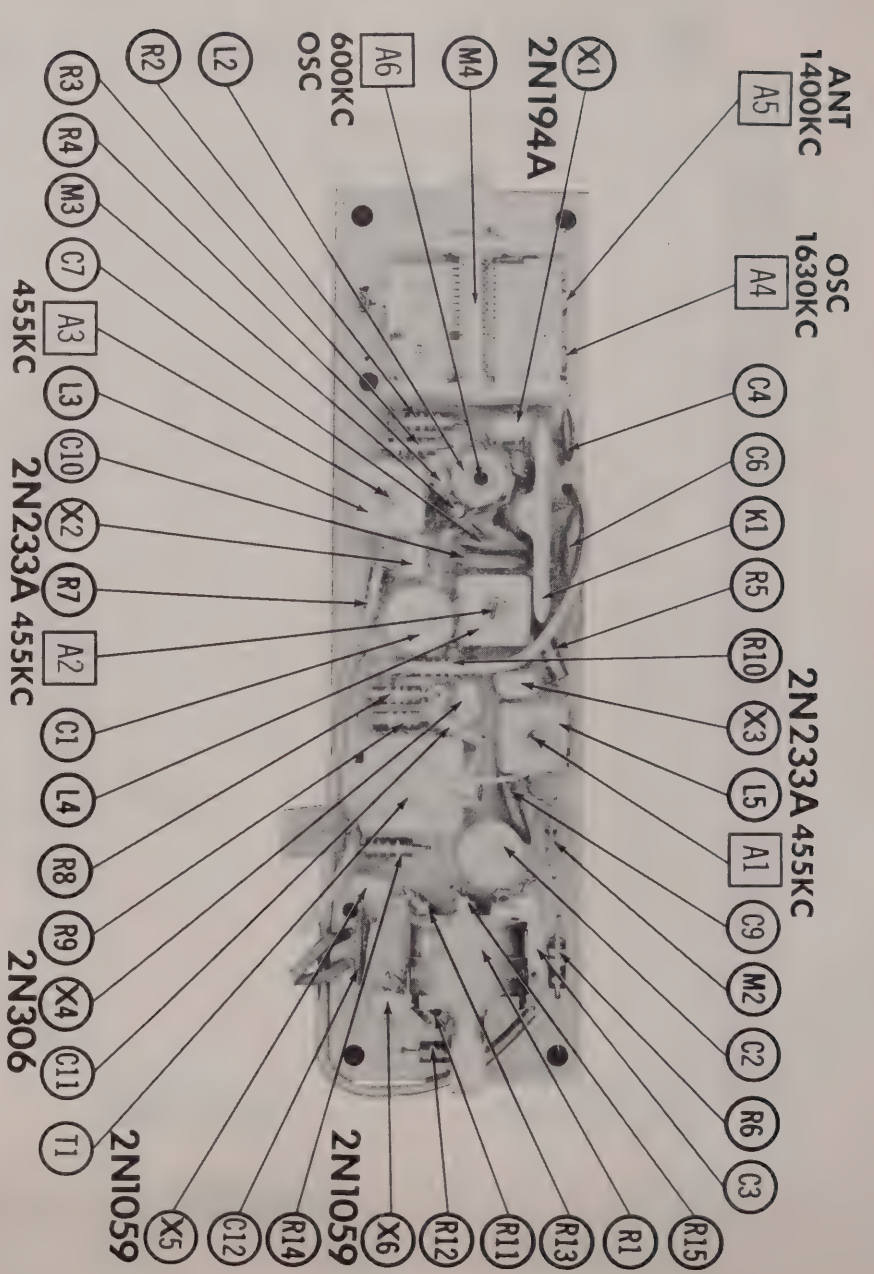
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1249-0	Tuning
Knob	52-1248-0	Volume
Cabinet	42-94-1	
Handle	49-525	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT* Folder

STROMBERG-CARLSON MODELS AF-601K, KS, M, MS, W, WS

STROMBERG-CARLSON MODELS
AF-601K, KS, M, MS, W, WS

MODEL AF-601MS

STROMBERG-CARLSON MODELS
AF-601K, KS, M, MS, W, WS

TRADE NAME	Stromberg-Carlson Models AF-601K, KS, M, MS, W, WS
MANUFACTURER	Stromberg-Carlson Co., Special Products Div., 1400 N. Goodman St., Rochester 9, N.Y.
TYPE SET	AC Operated 5 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 44 Watts, .45 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER (PART #148000-031 MONAURAL OR #148000-050 STEREO) - SEE SIMILAR V-M 959 - PHOTOFACT SET 396 FOLDER 13

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT314

SET 469 FOLDER 20

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •		GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	6AV6	V4	Output	6V6GT
V2	AF Amp.-Phase Inv.	12AX7	V5	Rectifier	6X5GT
V3	Output	6V6GT			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▬20	450	111090-000	AFH4-76	D0624	FP430.2	TMQ-90	TVL-4731	
B	■20	450							
C	▲40	350							
D	25	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C3	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C4	10		NPO		NPO-SI 10	TCZ-10	C10Q1C	CNO-410	5TCC-Q1	
C5	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C7	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C8	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C9	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C10	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C11	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C13	10		NPO		NPO-SI 10	TCZ-10	C10Q1C	CNO-410	5TCC-Q1	
C14	3	30		110626-000	P1589Z-3.0				118P30502S2	
C15	.01	600			P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½	145000-019					Volume, Tap @ 300K
R2A	1meg	½	145203-000	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3	1meg	½	145202-000					Bass

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	47K	
R5	10meg	
R6	82K	
R7	470K	
R8	5600Ω	

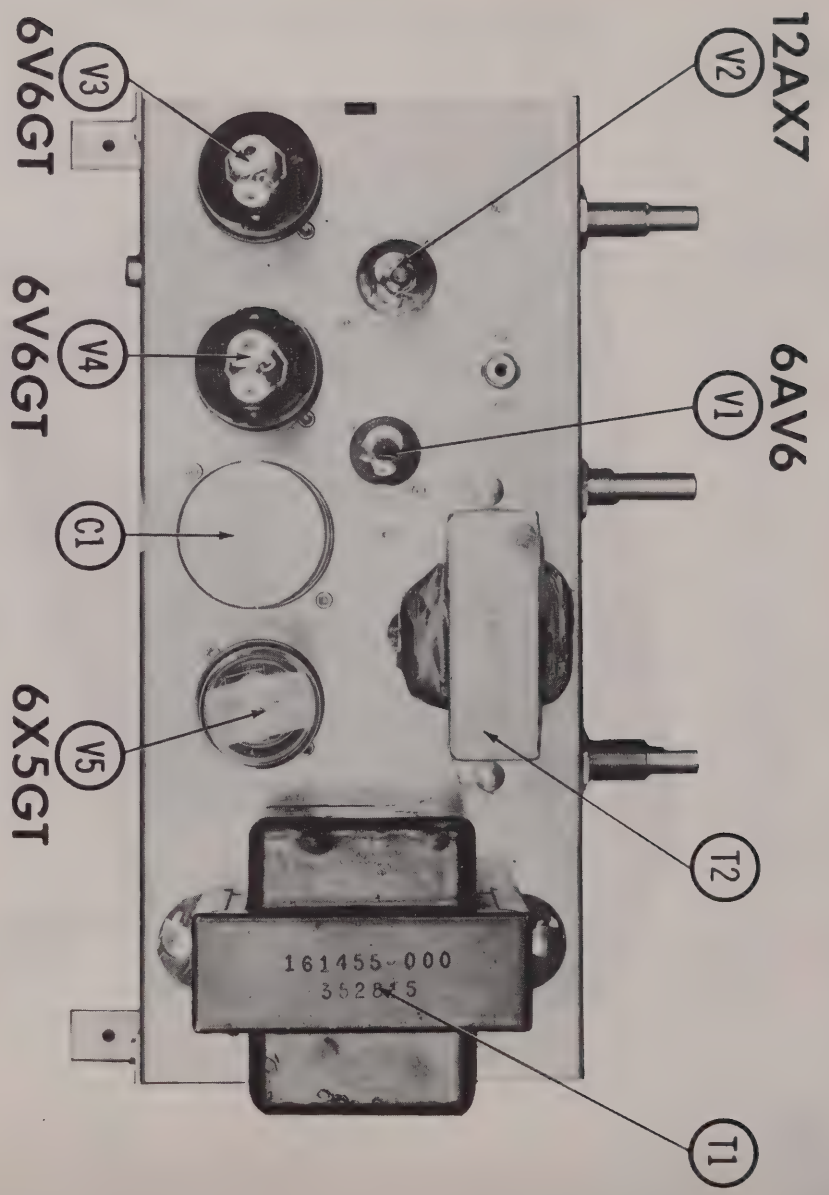
ITEM No.	RATING	REMARKS
R9	47K	
R10	3900Ω	
R11	3.3meg	
R12	220K	
R13	330Ω 2W	

ITEM No.	RATING	REMARKS
R14	47K	
R15	10K	
R16	5600Ω 2W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Stromberg-Carlson PART No.	REPLACEMENT DATA
K1	Output Grid Coupling	10000mmf, 10000mmf, 220K, 220K, 470K, 470K	179000-031	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .45A	620VCT @ .055A	6.3V @ 2A	161455-000						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7200Ω CT	6-8Ω	161302-000	22S58	A-2901	AU-609	A-3870	22S58	S-55X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Stromberg-Carlson PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	155000-009	69A2	
SP2	6" x 9"	PM	3-4Ω	155000-009	69A2	
SP3	3 1/2"	PM	10-12Ω	155372-000	3A15TZ10.6	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	Stromberg-Carlson PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	148000-046 * 148000-052 †	81-TB ♦	Not Req.	56 ‡	Not Req.			11TR-8 ♦	

* Stereo † Monaural ♦ Includes mounting mechanism. ‡ Use PT-2 Mount.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Stromberg-Carlson PART No.	JENSEN PART No.	WALCO PART No.	
M2	148000-048 † 148000-049 ♦ 148000-051 † ①	CRA57X† or CRA57XD ♦ S66 † or S66SD † ♦ or S66D ♦	W-75TPS † or W-75DS † ♦ or W-75TPD ♦	① Used in Models AF-601K, M, W † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M3	Switch		Stereo-Off-Cabinet Light (DPDT, Slide Type)
M4	Switch		Ext. Spkr-Both-Internal Spkr (DPDT, Slide Type)

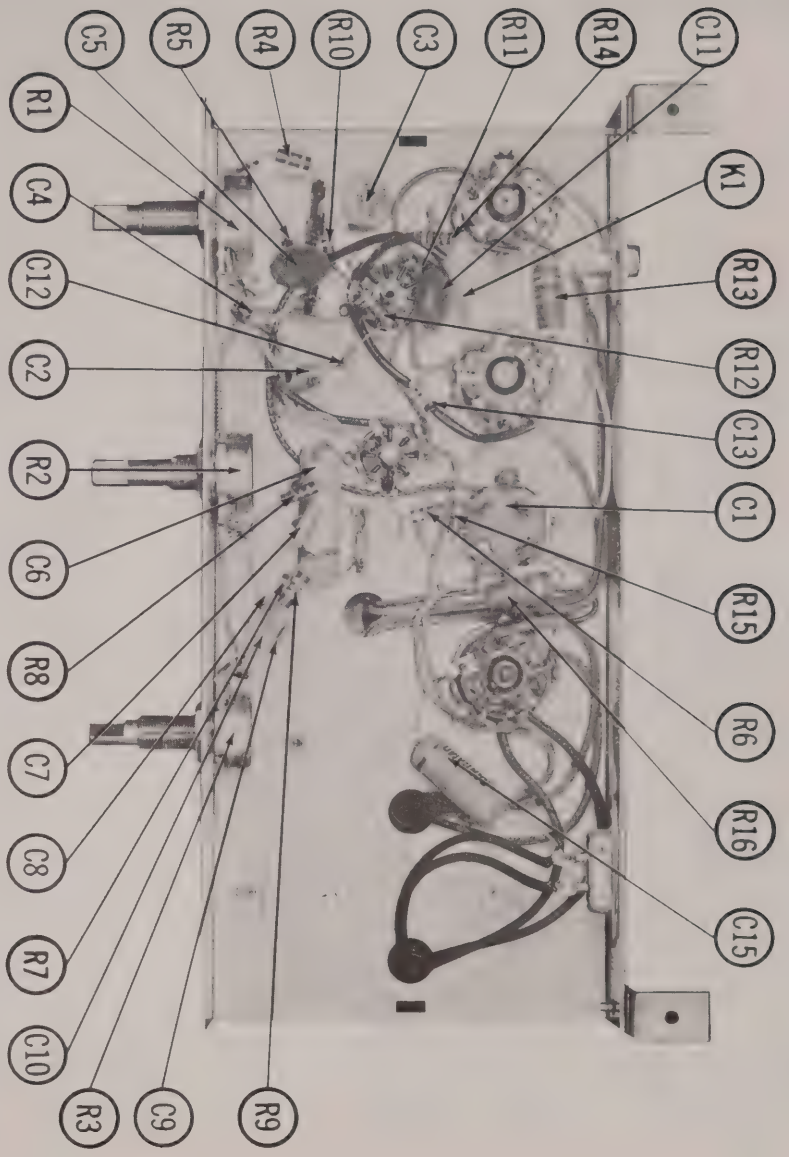
CABINETS & CABINET PARTS

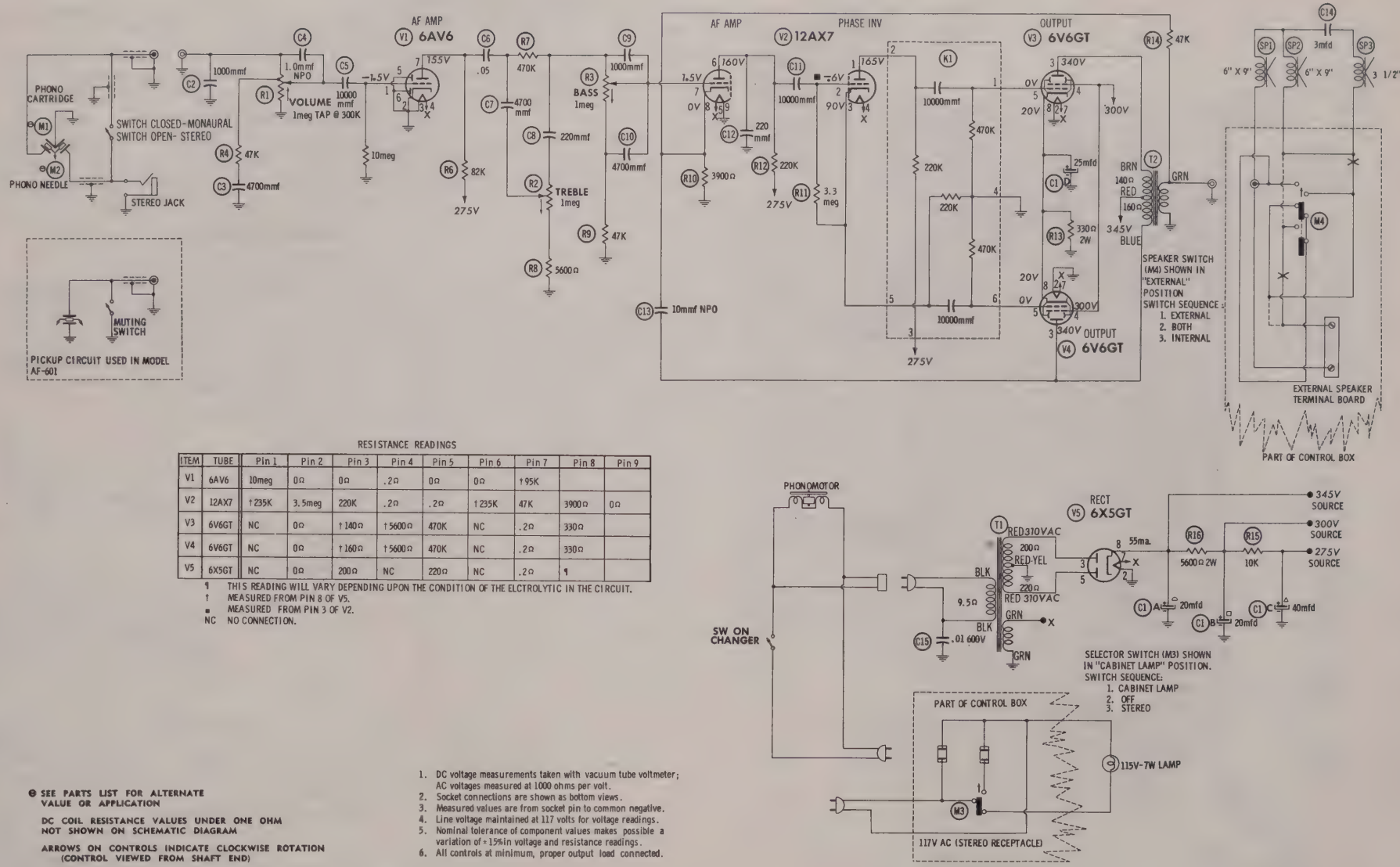
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	10meg	0Ω	0Ω	.2Ω	0Ω	0Ω	†95K		
V2	12AX7	†235K	3.5meg	220K	.2Ω	.2Ω	†235K	47K	3900Ω	0Ω
V3	6V6GT	NC	0Ω	†140Ω	†5600Ω	470K	NC	.2Ω	330Ω	
V4	6V6GT	NC	0Ω	†160Ω	†5600Ω	470K	NC	.2Ω	330Ω	
V5	6X5GT	NC	0Ω	200Ω	NC	220Ω	NC	.2Ω	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELCTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
▪ MEASURED FROM PIN 3 OF V2.
NC NO CONNECTION.

Ⓒ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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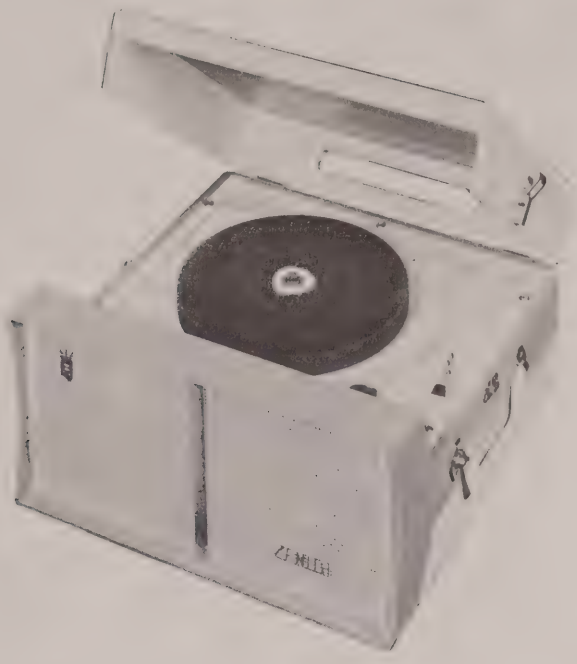
STROMBERG-CARLSON MODELS AF-601K, KS, M, MS, W, WS

PHOTOFACT* Folder

EIA MEMBER

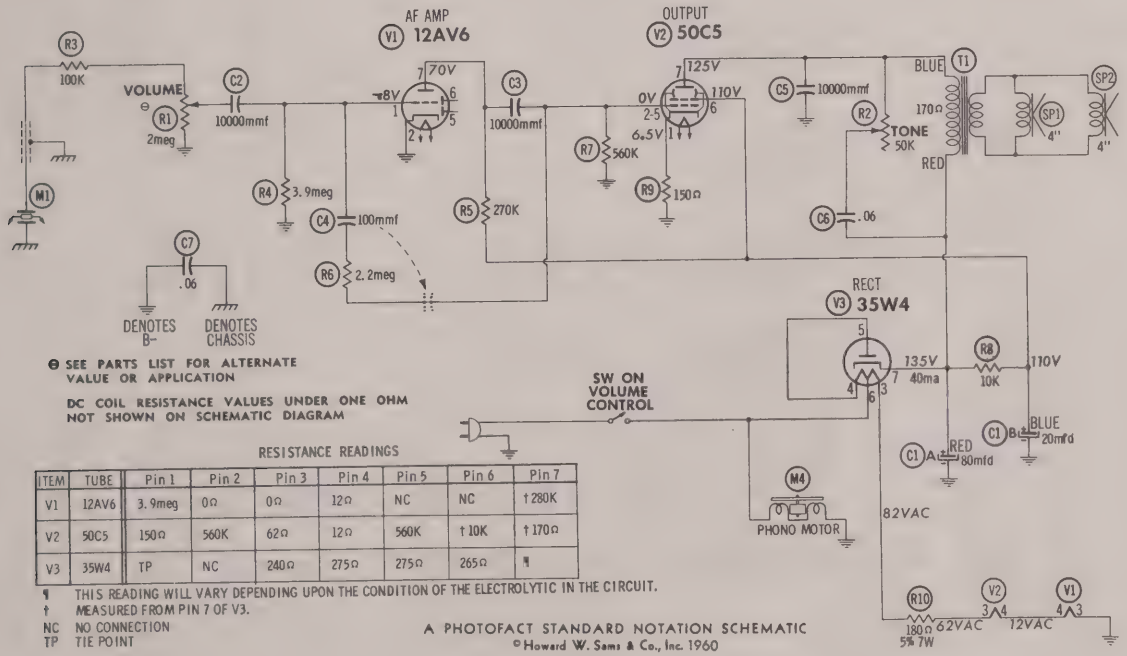
ZENITH
MODEL BP7F

ZENITH
MODEL BP7F



TRADE NAME	Zenith Model BP7F
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Manual Record Player
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 24 Watts, .27 Amp. @ 117 Volts AC (Less Motor)

ZENITH
MODEL BP7F



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AV6	3.9meg	0Ω	0Ω	12Ω	NC	NC	†280K
V2	50C5	150Ω	560K	62Ω	12Ω	560K	†10K	†170Ω
V3	35W4	TP	NC	240Ω	275Ω	275Ω	265Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JR371

SET 469 FOLDER 21

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	AF Amplifier	12AV6
V2	Output	50C5
V3	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	WC13130	PRS150V8020	BBRT53215	WD220	TDLD-10	TVA-2460	
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	CCD-103
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	CCD-103
C4	100		BPD-0001	DD-101	L10T1	CCD-101	UC-531	5GA-T10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.06 200V		P288N-06		CUB6S6	6DP-4-603	GEM-616	6TM-S6
C7	.06 200V		P288N-06		CUB6S6	6DP-4-603	GEM-616	6TM-S6

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES	
R1A	2meg	½	12600	B-76	A47-2meg-Z	Q13-139	TA26A	Volume	Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		
C	Switch			KR-1	SWE-12	76-1	US-26	Off-On	
R2A	50K	½	WC12599	B-32	A47-50K-Z	Q13-123	TA54A	Tone	
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		

Note 1. Some versions may use 2meg volume and switch Part #WC13069.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	100K	
R4	3.9meg	
R5	270K	

ITEM No.	RATING	REMARKS
R6	2.2meg	
R7	560K	
R8	10K	

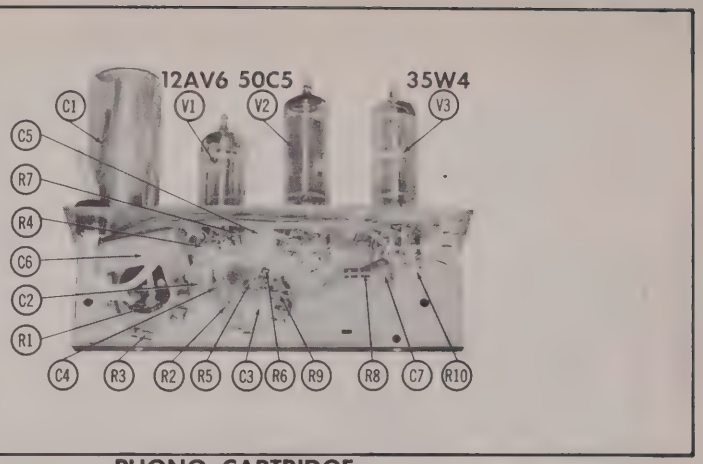
ITEM No.	RATING	REMARKS
R9	150Ω	
R10	180Ω 5% 7W	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2700Ω	1-2Ω	WC11876 ①	24S48	A-3026			24S48	S-6X	① Part of Speaker WC13087

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	WC13087 ①②	4A07 ②	① Includes T1.
SP2	4"	PM	3-4Ω	WC11792 ②	4A07 ②	② Parallel and Phase.



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ZENITH PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	142-96	316-TS	N8-1 & N8-3			33	† CRA-55 or ♦ CRA-55D and † CRA-55LP or ♦ CRA-55LPD		

† Jewel ♦ Diamond

ASTATIC AND JENSEN NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA ZENITH PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M2	56-371 (LP)	W-64MGS † or W-64MGD ♦	CRA55LP † or CRA55LPD ♦	† Jewel ♦ Diamond
M3	56-372 (STD)	W-64S † or W-64D ♦	CRA55 † or CRA55D ♦	

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M4	Motor	WC13195	Phono Drive (Alliance)
	Motor	WC13197	Phono Drive (G. I.)

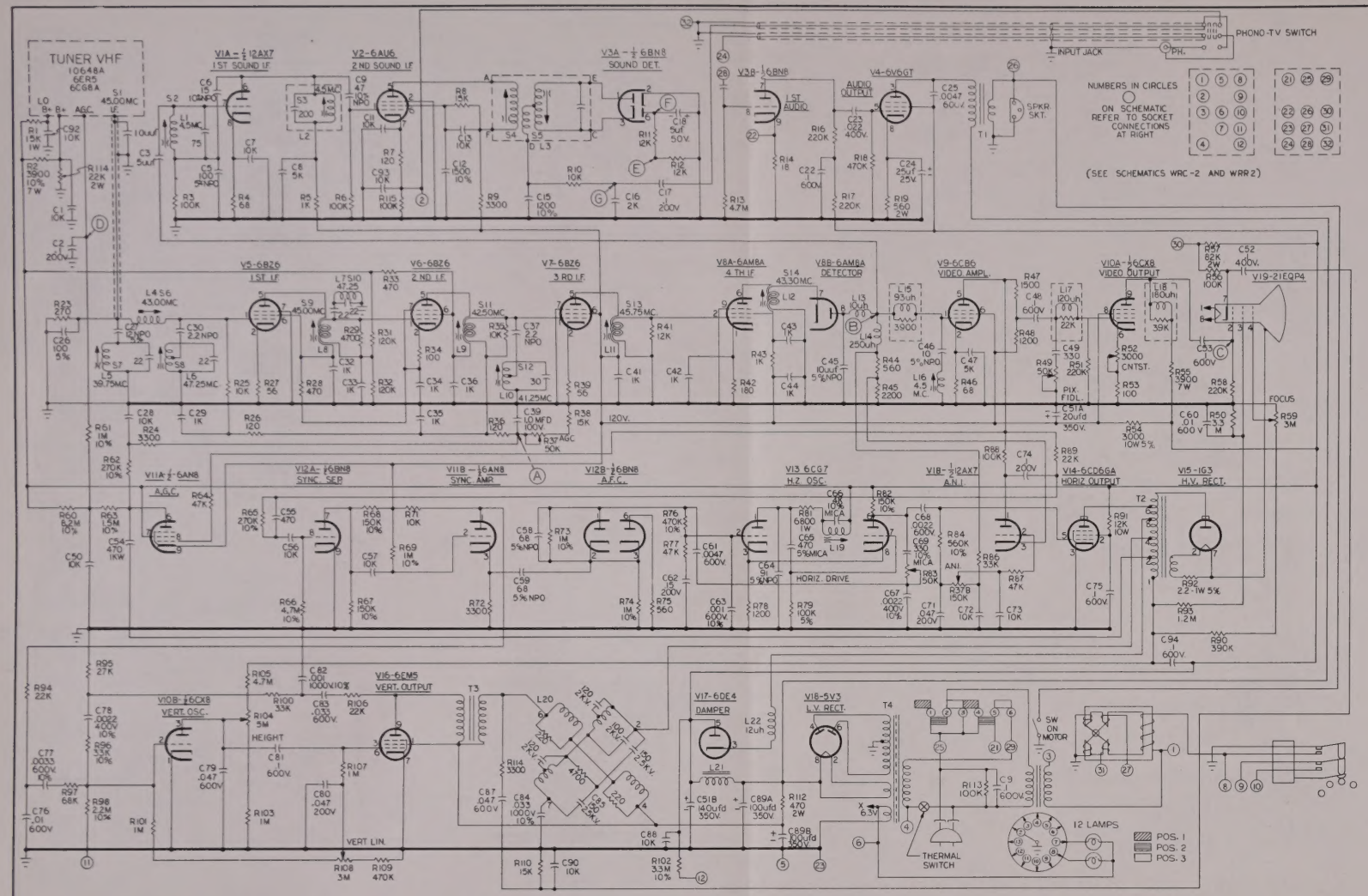
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	WC121264E	
Cabinet	WC13155	Includes Hardware
Handle Assembly	WC103568B	

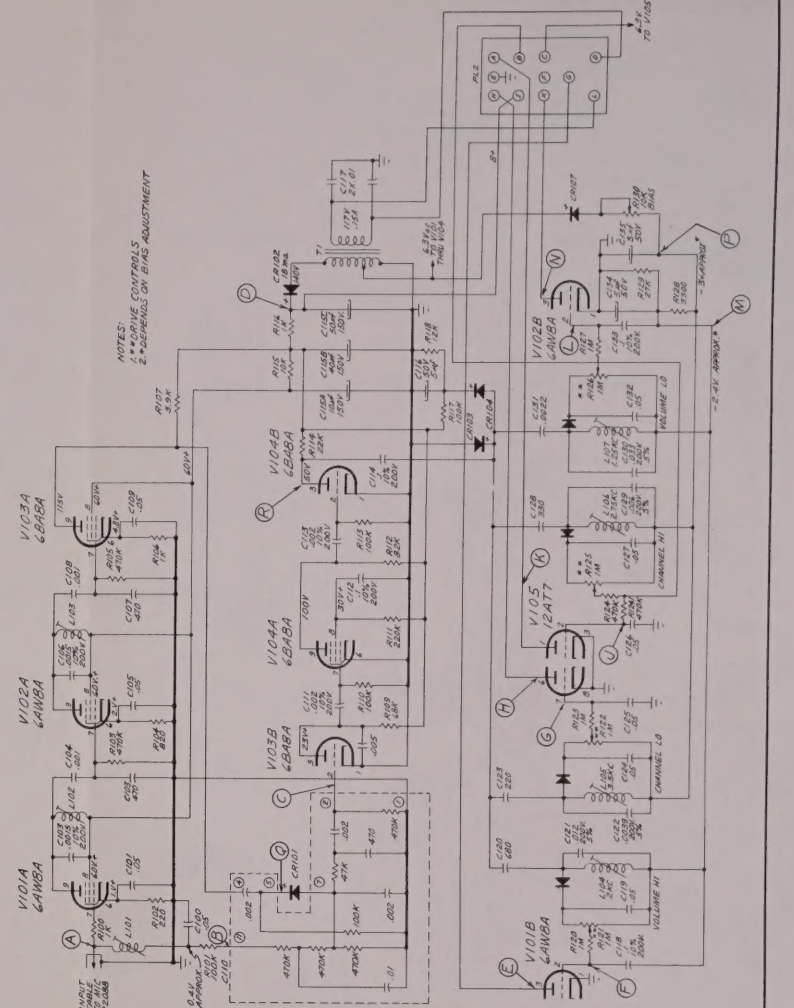
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



PACKARD BELL MODEL 21DC16 (CH. 98D6, WRR-2, WRC-2, WRT-2)

Schematic Diagram Courtesy of Packard Bell Electronics Corp.

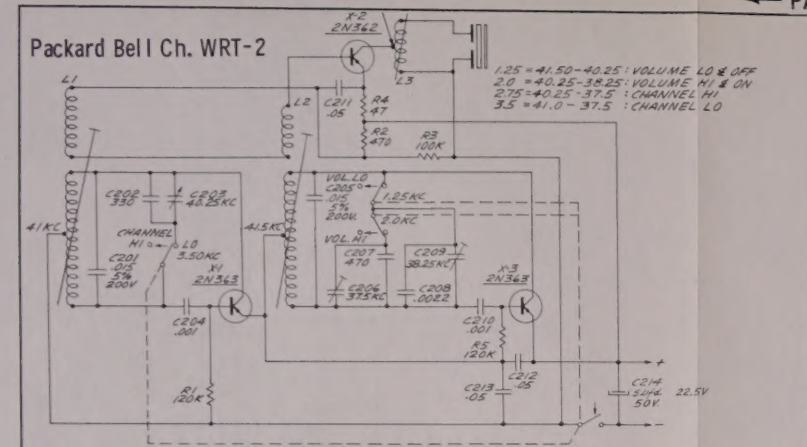


Packard Bell Ch. WRR-2

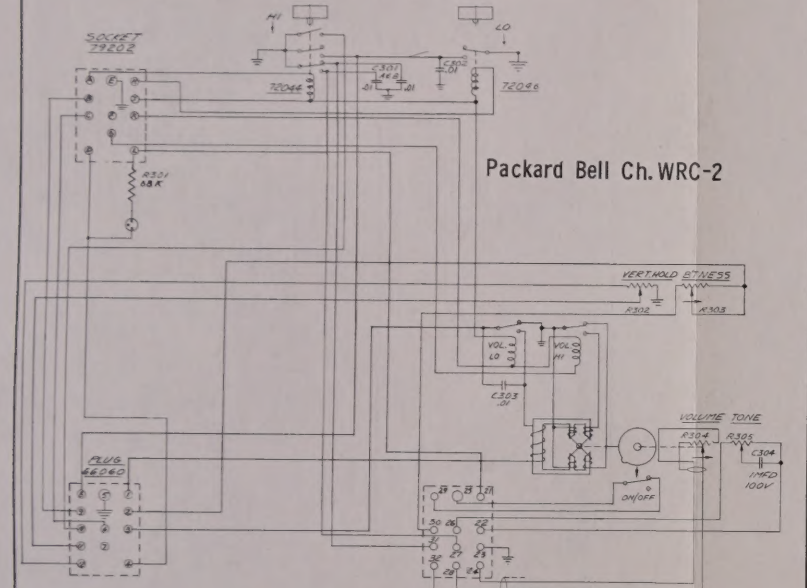
← PACKARD BELL

HOFFMAN

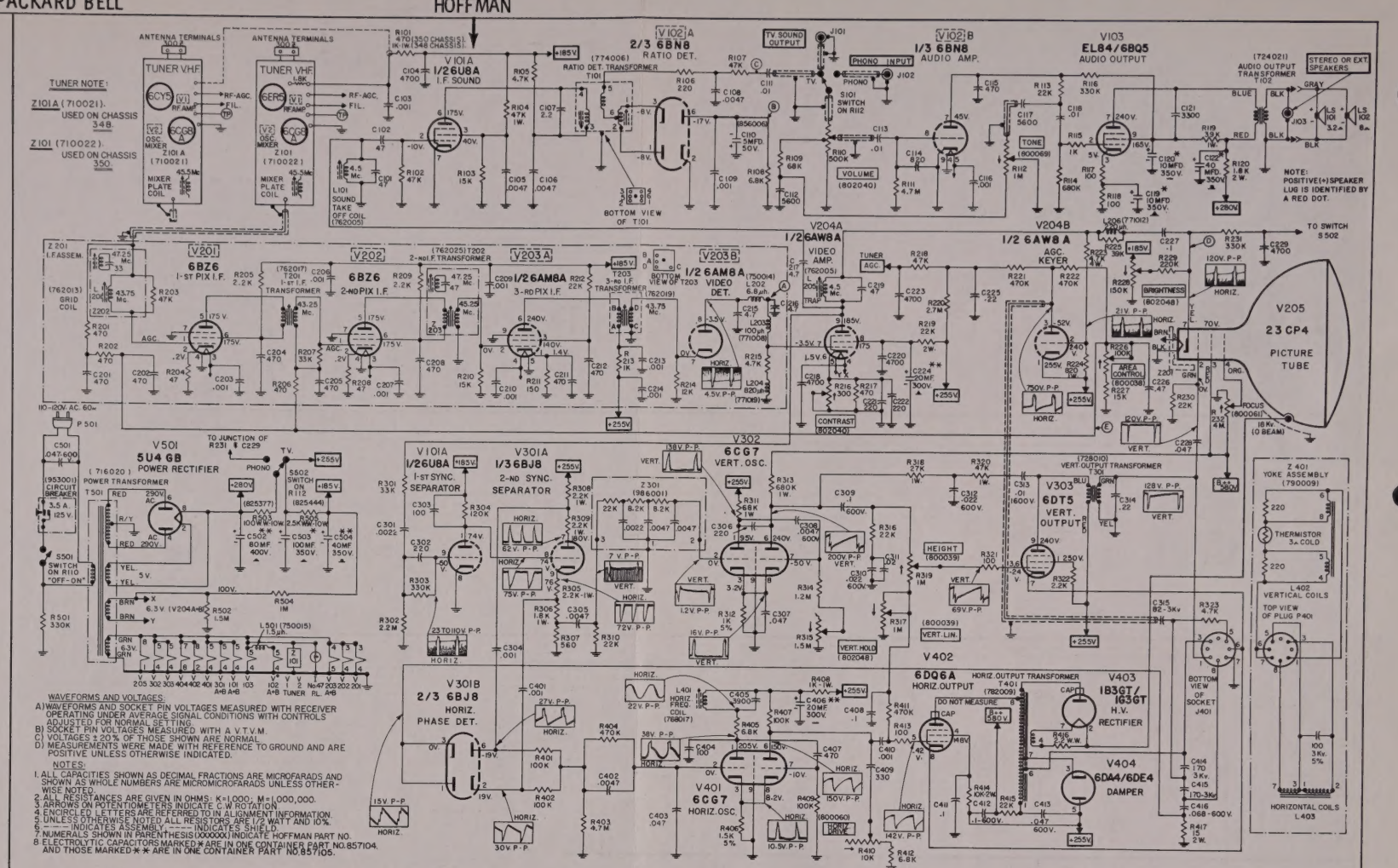
Packard Bell Ch. WRT-2



Packard Bell Ch. WRC-2



Schematic Diagram Courtesy of Packard Bell Electronics Corp.



HOFFMAN MODELS B3653, B3663, B3673, B3683, M3653, M3663, M3673, M3683, SP3653, SP3663, SP3673, SP3683, W3653, W3663, W3673, W3683 (CH. 348, 350)

Schematic Diagram Courtesy of Hoffman Electronics Corp.

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